September 1981

Smithsonian

A painter of birds, Edward Lear,
for limericks was known far and near.
But this handsome owl
and assorted fine fowl
show Lear in his other career (p. 106)

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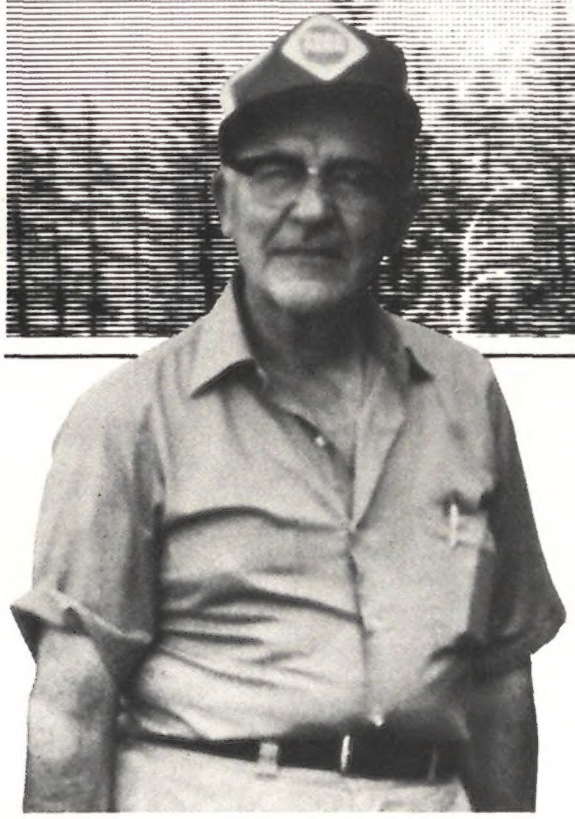

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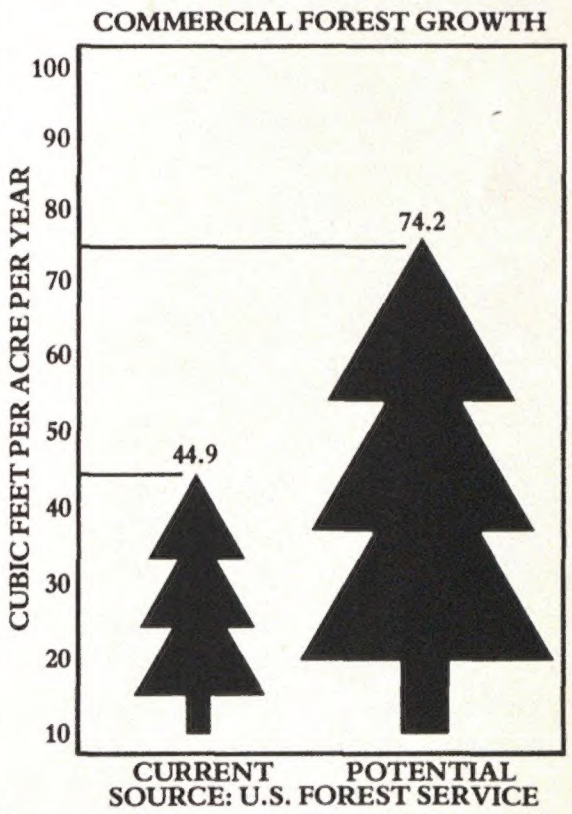

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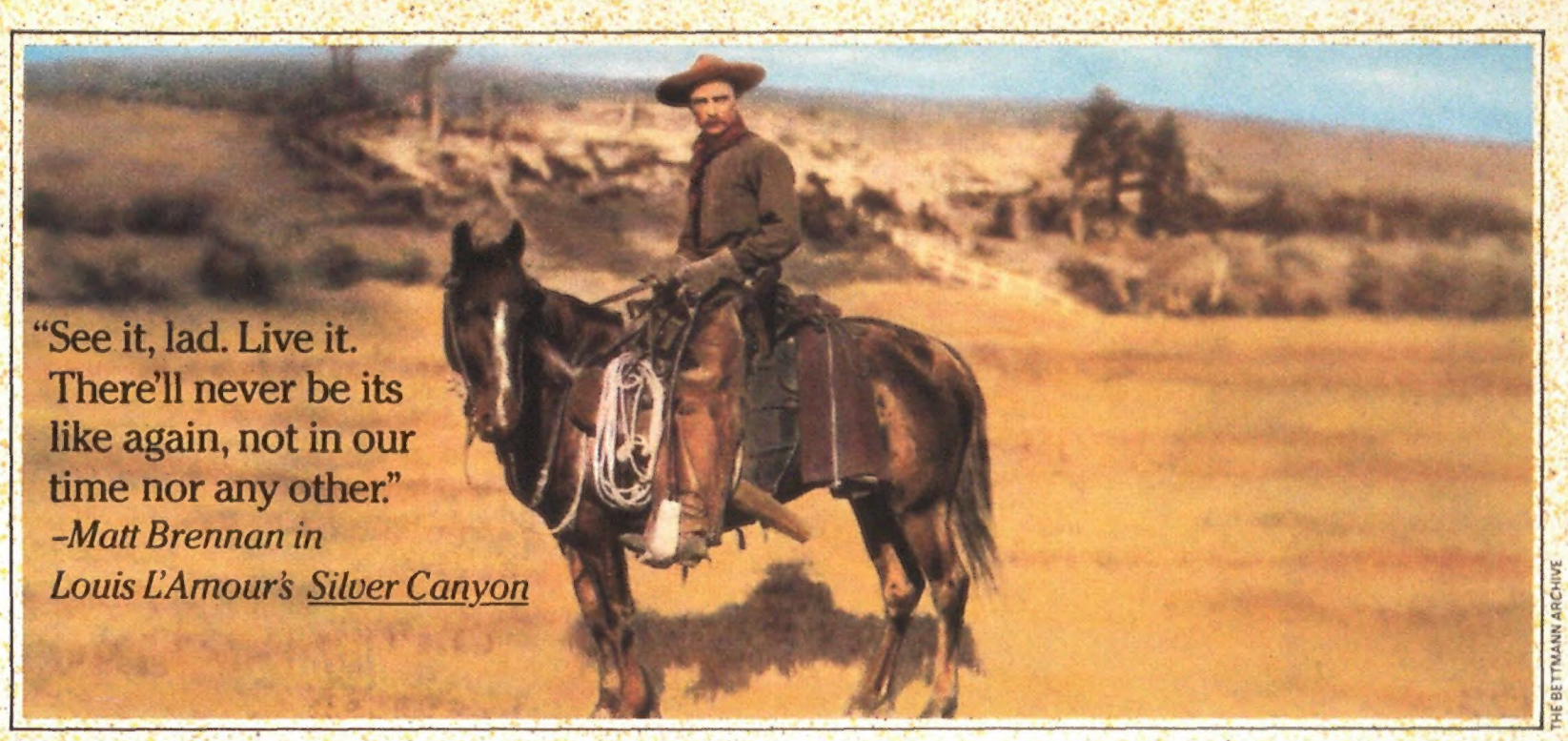
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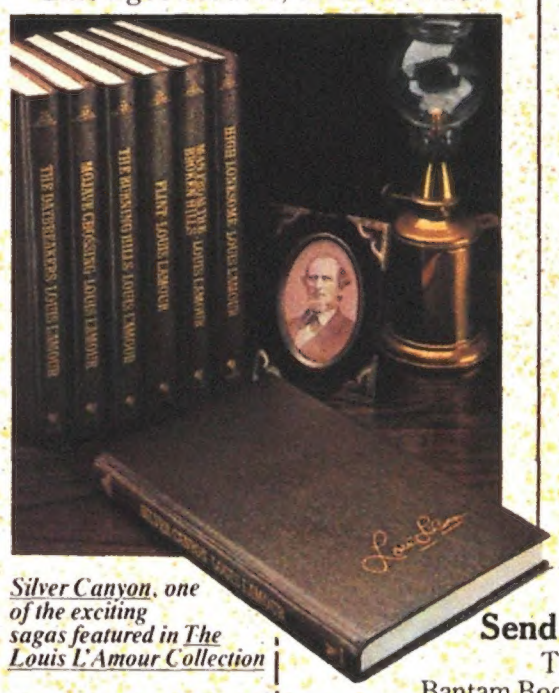

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September 1981

Smithsonian

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Table of Contents

COVER: Edward Lear, of limerick fame, shows another side of his career with this remarkable drawing, about which one critic said: "No bird has ever stared forth from a page with such startling self-possession as his massive Eagle Owl" (p. 106)

8 The view from the castle: Secretary Ripley's comments

12 Letters to the Editor

22 Around the Mall and beyond by Edwards Park

30 Phenomena, comment and notes by John P. Wiley jr.

40 Points of origin by Michael Olmert

46 Picture credits

50 A generation meets computers—and they are friendly
Article by Paul Trachtman, photographs by Dan McCoy

62 The Greatest Show on Earth was nothing compared to home, as John Ringling proved with his museum and private mansion
Article by Robert Wernick, photographs by Marvin E. Newman

74 An American dilemma over jobs and health in Kellogg, Idaho, is symbolized by lead regulatory conflicts and clean-up efforts
Article by Cassandra Tate, photographs by William Thompson

84 A lonely but free life at the southern edge of the world
Article by Fred Strebeigh
Photographs by Fred Strebeigh and Martin Rogers

96 Early in the 1900s, Americans went wild over photographic postcards
By Hal Morgan and Andreas Brown

106 The remarkable Edward Lear, master of nonsense verse, was also an accomplished artist whose birds rivaled Audubon's
By Joseph Kastner

120 Chemical warfare flourishes among creatures of the reef
Article by Joseph S. Levine, photographs by Jeffrey L. Rotman

130 A latter-day Icarus tries to achieve a solar dream house
Article by Les Daly, illustrations by Cameron Gerlach

140 The posh palaces of yesterday's Hollywood stars
By Charles Lockwood

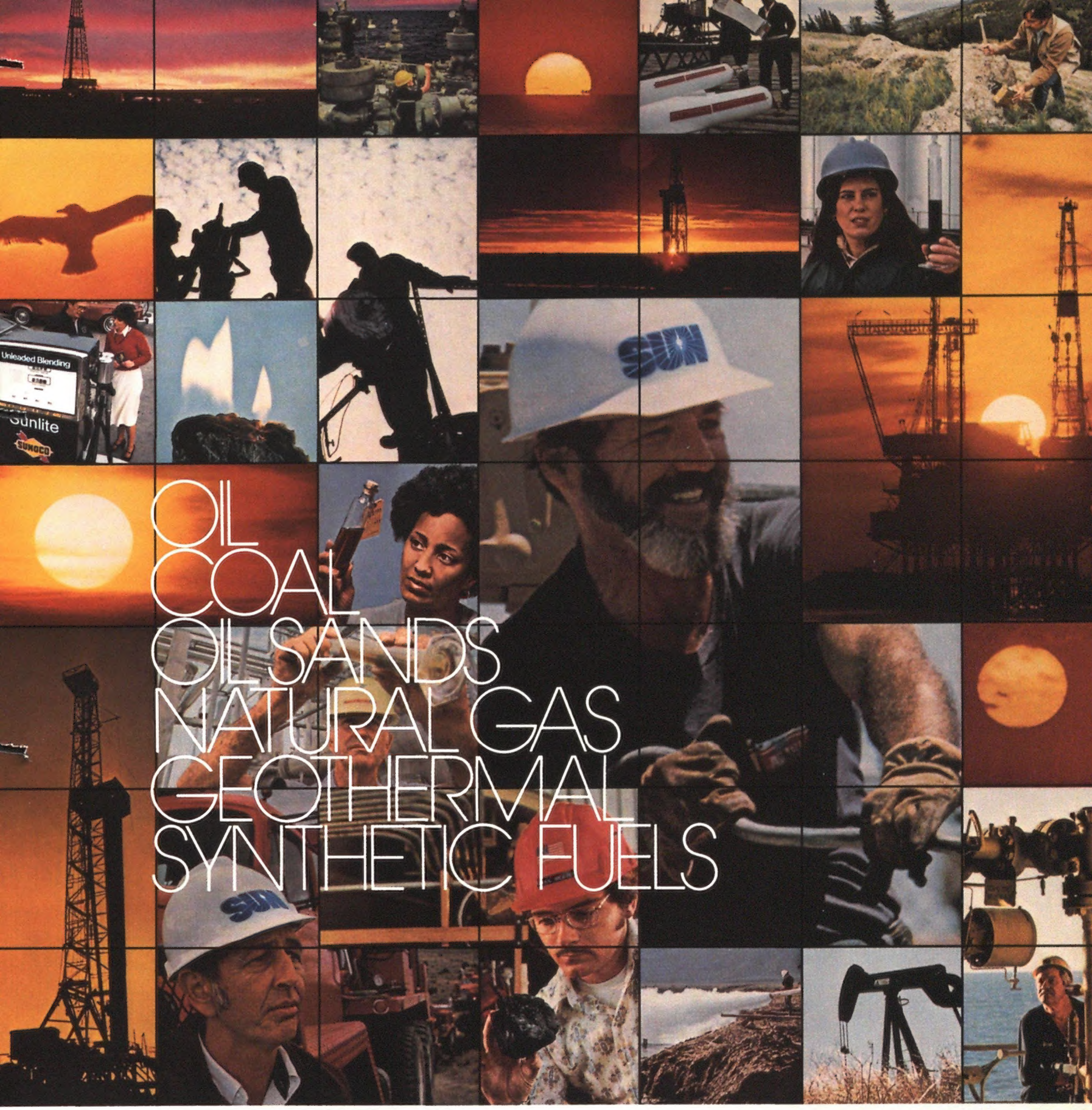
160 Book reviews

176 Additional reading

180 September events at the Smithsonian

186 Smithsonian tours

188 They still cross swords over those crosswords
By Richard Wolkomir



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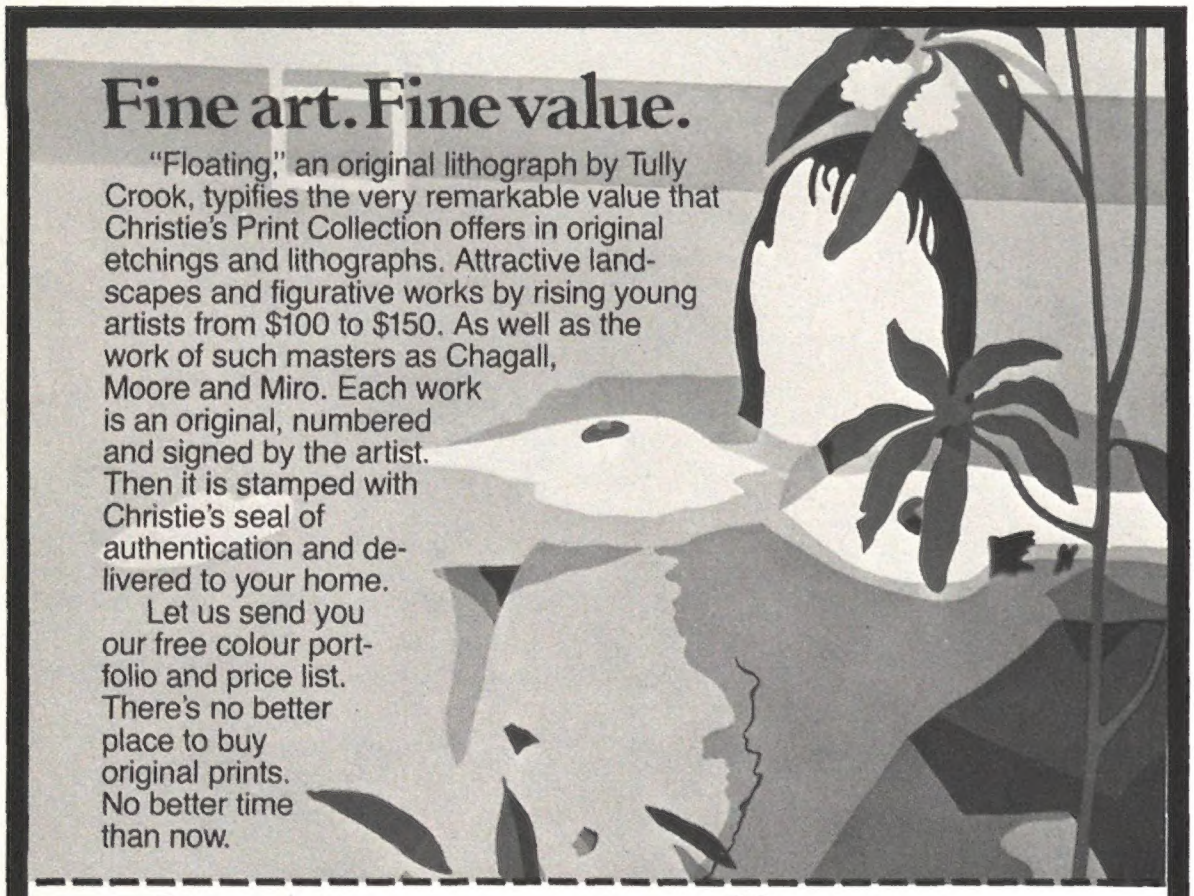

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Secretary Ripley's comments

The view from the castle

Our highly developed techniques for exhibiting and explaining the past may be useful in looking to the future

The role of the Smithsonian as an interpreter of America is something like that of a planetarium delineating the past, mirroring the present and foretelling the future. The 19th century seemed easy: ours was a land of opportunity, of limitless space, of an endless frontier and wide-open hearts for immigrants from many lands—"Give me your tired, your poor,/ Your huddled masses yearning to breathe free." The 19th century was the age of developing skills in crafts, of patented inventions, of patent medicines.

The 20th century by contrast has seemed perplexing with its wars and social turmoil, incessant change, triumphant transportation and communications. But that has created a paradox: the more we travel and communicate, the less we understand about ourselves and others. The end of the 20th century presages more of the same, as well as enormous social disparities, the administration of more and more by fewer and fewer, a high priority on the acquisition of skills, and acute lack of opportunity for the unskilled, transfers of training without intellectual perception, and the possible disappointment of heightened expectations for the masses. Over all hangs the spreading threat of nuclear disaster.

And finally, how to look ahead to the 21st century? What can we at this Institution do to exhibit the future? We can forecast much through our own version of what is thought of today as "science fiction." Our astrophysicists can tell us a good deal that is predictable based on current discovery. Our biologists can tell us much of our environmental future by assessing rates of change. Recent research on pheromones, on acoustical response, on adjustments by organisms to chemical changes in water and air, all bring evidence of genetic adaptations in nature that we would consider, from the human point of view, to be akin to "genetic engineering."

Computer technology may well become the key to an amelioration of the human condition. Will utopia be achieved—or mass destruction? Will education be capable of preserving levels of competence and intellectual progress, or will it succumb to rote training? Will individuality survive in human, animal and plant life, guaranteeing a cadre of diversity for the preservation of life itself?

The Smithsonian, as a pioneer in education through exhibit techniques and the study of "interest arousal," should be able to develop a blueprint for the future as skillfully as we have limned the past. That could be one of our goals, undertaken as a part of the "increase & diffusion of Knowledge among men."

Perhaps it is an impossible goal, to play Jules Verne as it were, looking to a future predicted from past and present. But we feel an obligation to stretch our vision if only to attempt to reimburse those who in the past have supported us with money and in kind. We owe a debt to everyone in America as custodians of artifacts, our support guaranteed by a major measure of government funds over the years. I would hope that this Institution would accept that trust actively, not passively, and use the knowledge acquired to present some pictures of the future. It would surely be a signal achievement.

S. Dillon Ripley

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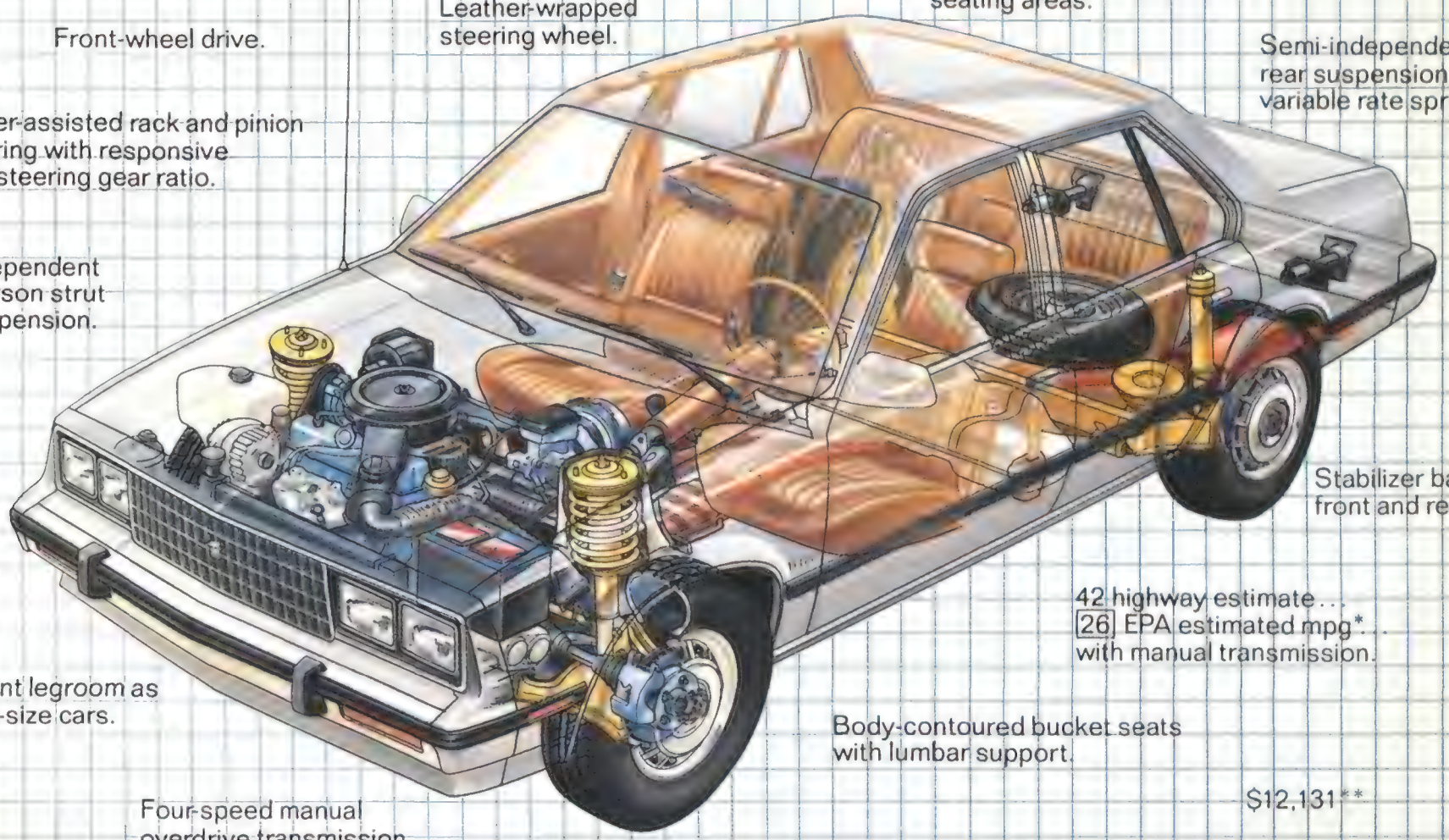

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LTV. Looking Ahead

Should America continue to subsidize its merchant fleet? Two top economists disagree

YES— NEED FOR SECURITY

Robert R. Nathan
Chairman, Robert R. Nathan Associates, Inc., Consulting Economists

There are serious security considerations...it is appropriate that stern economic criteria be applied...

Given the huge and continuing subsidies and other costly provisions that are needed for international liner operations, it is impossible to justify the continuation of America's merchant marine on purely economic grounds. The costs of constructing vessels in the United States and their operating costs are so high relative to costs of foreign shipyards and operators as to preclude—at least for the present and foreseeable future—the prospects for a successful United States merchant marine without subsidies.

Therefore, economists could conclude that this country would be better off by letting our merchant marine either compete or disappear. However, there are serious security considerations which, in my judgment, warrant a program to assure at least that minimum available level of ocean shipping facilities to provide some degree of contribution to our national security.

Air transport of military manpower and equipment has improved, but there are still substantial military needs for ocean shipping facilities.

If we do conclude that a subsidized American merchant marine is justified on security grounds, as I believe, then it is entirely appropriate that the sternest economic criteria ought to be applied in deciding how best to achieve that security objective at the lowest possible cost.

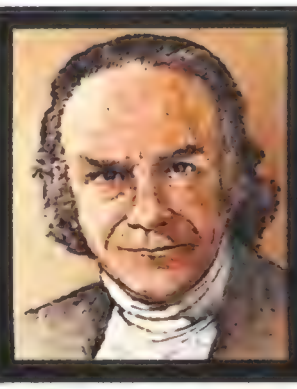
Many experts in the marine field currently have doubts whether the present practices and procedures are compatible with the objective of carefully scrutinizing the costs essential for fulfilling the minimal ongoing security needs of the United States.

Recurring reviews

Most obvious, there should be recurring reviews—perhaps once every three to five years—of the methodology and the data sources which serve as the bases for determining levels of construction and operating differential subsidies. With dramatic changes occurring in productivity, inflation and other international competitive conditions, the government should try to assure reasonable balance between essential incentives and minimal subsidies. Government subsidies should not underwrite excessive profits; rather the costs of capital in setting subsidies should take into account realistic risk factors.

There are private United States carriers who transport on their own account or who are engaged in domestic coastal or international tramp operations, who are not directly subsidized. However, they do benefit from certain cargoes that are reserved for U.S.-flag companies and they move at higher than international tariffs. For that preferential cargo they are protected from foreign competitors and presumably from U.S.-subsidized carriers.

In summary, incentives of a non-direct subsidy nature should be sought, multiple operating incentives should be avoided and strict monitoring of financial results should be a firm requirement.



NO— IT DOESN'T WORK

Allen R. Ferguson
President, Public Interest Economics Center

We cannot make the American-flag fleet competitive by continuing to subsidize its inefficiencies...

Why can't the American merchant marine swim; why can't it compete—at least without Federal support? In fact, much of it can and does compete. Hundreds of ships owned by American corporations operate under Liberian, Panamanian and other "flags of convenience."

The more visible part of the American-owned fleet, subsidized American-flag ships in scheduled liner service, however, cannot compete *under present* law. Two major restrictions hobble them:

(1) They may sail only American-built ships manned only with "citizen" crews. Failure to do either precludes them from receiving subsidies or from serving the domestic trade.

(2) U.S. shipyards are far less efficient—less productive—than are foreign yards and American crews are more expensive—that is, are less productive per wage dollar—than foreign crews.

As the capital intensity of ocean transport increases, with containerization and greater ship size and speed, the burden of the crew requirement will decline, but the burden of sailing American-built ships will increase.

We *cannot* make the American-flag fleet competitive by continuing to spend some three-fourths of a billion dollars per year to subsidize its inefficiencies, and billions more, indirectly, to protect it from competition in the domestic trades.

We *can* make it competitive by removing the legal requirement that U.S.-flag carriers operate American-built ships. Eventually, removing the mandate to use American-citizen

crews or so changing it as to reduce its incentives to inefficiency would also be sound, but less important and politically harder.

It is sometimes argued that defense needs dictate that U.S.-built ships be used and subsidized in ocean commerce. In fact, essential shipbuilding capacity is sustained under naval contracts. Most of the subsidized ships are of little use to the military, as naval authorities have testified; the advocates of construction subsidies dare not put them into the Defense budget because they fear (rightly) that military planners would find other expenditures more important. Real military needs could be better met by buying cargo ships in the open market and holding them in the reserve fleet. That fleet has proven to be extremely valuable in military crises. The reserve fleet is obsolete, but could be renewed at bargain-basement prices.

Thus, an administration devoted to free enterprise could make the American merchant marine competitive by "stroke-of-the-pen-technology" and could save taxpayers and consumers hundreds of millions of dollars. With such a simple change the domestic trade could also be opened to free competition, reducing the price of oil and lumber in the Northeast and of nearly everything in Alaska and Hawaii.

WHAT THE PUBLIC THINKS

Reported by
Kenneth Schwartz
Vice President, Opinion
Research Corporation

The reality is, this is not a "hot issue" with the public. But among those who know "something"...62 percent favor subsidy.

It is important that we put this information into the proper perspective. On LTV's behalf, ORC polled 1003 people between May 14-17, 1981. However, before we reached the specific question on subsidy, we first asked, *"How much have you heard or read about the size and condition of the United States merchant shipping fleet?"* A great deal? A fair amount? A little? Nothing at all?

Results: great deal, 3 percent; fair amount, 13 percent; little, 45 percent; nothing at all, 38 percent; don't know, 1 percent.

We then asked the 61 percent of the original respondents who answered *"great deal, fair amount or little"* some subsequent questions. So, please keep in mind that the next section of this column deals only with answers given by that 61 percent who professed at least a little knowledge of the subject.

How did they respond to the topic addressed here by the two distinguished economists, Nathan and Ferguson? *"Would you favor or oppose the Federal Government providing financial subsidies for a merchant shipping fleet?"*

In favor: 62 percent. Opposed: 25 percent. No opinion: 13 percent

Three other questions relative to views on the merchant fleet were asked. (The responses are in parenthesis.)

(1) From what you have heard or read, how would you describe the size and condition of the U.S. merchant shipping fleet? Would you say it is adequate for our country's needs (19 percent)? Somewhat inadequate (48 percent)? Or very inadequate (22 percent)? No opinion accounted for the remaining 11 percent.

(2) As far as you know, can our merchant shipping fleet compete satisfactorily with foreign fleets (yes, 19 percent)? Or has our fleet fallen behind competitively (fallen behind, 64 percent)? No opinion, 17 percent.

(3) Is the defense of our country in any way dependent on the strength of our merchant shipping fleet (yes, 72 percent)? Or doesn't the merchant shipping fleet play any role in our defense (no role, 12 percent)? No opinion, 16 percent.

WHAT LTV BELIEVES

Speaking for
LTV, Paul Thayer
Chairman of the Board and
Chief Executive Officer

LTV is focusing attention on this issue because we believe it is an important one—and one that is widely misunderstood.

A strong American merchant marine is essential to our country's well-being and security. The U.S. needs a healthy maritime industry. Given the realities of international shipping today, that requires subsidies.

The U.S. merchant marine is made up of privately owned companies such as our own Lykes Bros. Steamship Co. These companies are efficient, innovative and progressive. Their seagoing and shoreside personnel are U.S. citizens. Their ships are built in U.S. yards to the world's highest standards, helping to support the shipbuilding base our Navy depends upon. An example is the unique SEABEE barge-carrying ships developed by Lykes. These 875-foot vessels carry thirty-eight 1,000-ton capacity barges across the ocean, reducing shipping time and costs. Our three SEABEE vessels are regarded as ideal for defense transportation needs and they stand available—as do the 43 other vessels of our Lykes fleet—if required. If the Navy had to build and operate its own cargo-carrying fleet, the cost to taxpayers would be enormous, and the time delay dangerous.

Advantages of foreign competitors

The efficiency and innovation of the U.S. merchant marine cannot offset the cost advantages enjoyed by foreign competitors, who may enter our commerce and ports without duty or restriction. A growing number of foreign lines are government-controlled and do not operate for profit.

These ships are built and manned by workers whose wages are far below American levels. Subsidies are designed to make up the difference between our on-board wage levels and the composite cost of our competition. They do not guarantee a profit to U.S. companies. They do not cover shoreside costs. They do not place the U.S. operator at parity with foreign competitors.

Defense needs alone justify support for a merchant marine. But there are other reasons. The private U.S.-flag merchant fleet serves our country's commercial needs. These companies are alert to the needs of our exporting and importing firms and help to maintain fair ocean freight charges. The U.S. fleet contributes to our balance of payments and protects the public from dependence on foreign carriers for essential materials and goods.

The industry has served us well. Maritime subsidy programs, averaging about $400 million per year, are a small price to pay for such a vital national asset.

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Letters to the Editor

Pet therapy

Dear Sir: In reference to Patricia Curtis' article in the July issue, I volunteered with the Cheff Center for the Handicapped program in 1970 at the age of 15, when Cheff had just opened its doors. It was everything a girl who had always wanted a horse and a girl who enjoyed children could have wanted—and then some. I worked as often as possible for five years and saw how the program increased the self-confidence and improved the self-images of the students. I saw how my own perspectives changed regarding the human dignity of children and adults with physical, emotional or mental difficulties. On a much more personal level, my own self-image improved. No matter how busy Lida McCowan was, she always made me, a volunteer, feel like a million dollars! Today I'm volunteering to work with a smaller-scale program of horseback riding for the handicapped in Berrien County, Michigan. Like Hazel Ake, I'm addicted!

Patrice S. Emmerson
St. Joseph, Michigan

Dear Sir: Patricia Curtis' moving article merits special attention in this U.N. International Year of Disabled Persons. Eugene Richards' remarkable photographs deserve an accolade in their own right.

Lee A. Carrillo
Denver, Colorado

Dear Sir: Miss Curtis' article certainly rang a bell with me. After recovering from severe depression several years ago, I found it difficult to relate to people. Since I had always loved animals, I de-

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cided to adopt a kitten and a six-month-old part-Dalmatian puppy. I discovered, however, there was a lot more to living successfully with two young animals than just playing with them. Their care, feeding and training brought me out of myself and into the world of reality. Today, our little family continues and my world has enlarged to include a job, a new career and many new human friends. I believe I owe my life and much happier outlook to my pets' never-failing confidence in me.

Virginia Lamarche
Spring Lake, New Jersey

Dear Sir: For some 30 years I worked at the famed Perkins School for the Blind and saw how much some of the blind teachers liked their dogs. In the course of writing *A Short History of Guide Dogs for the Blind*, I was amazed by the dogs' history, which went far back into ancient China, Pompeii and to artists like Rembrandt [see below]. Dogs were being used then as real guide dogs for the blind.

Nelson Coon
Vineyard Haven, Massachusetts

Rembrandt's *The Blind Fiddler,* 1681

Rodin

Dear Sir: As author of the Rodin text, I would like to call your attention to three errors relating to the illustrations which you selected. First, the drawing on page

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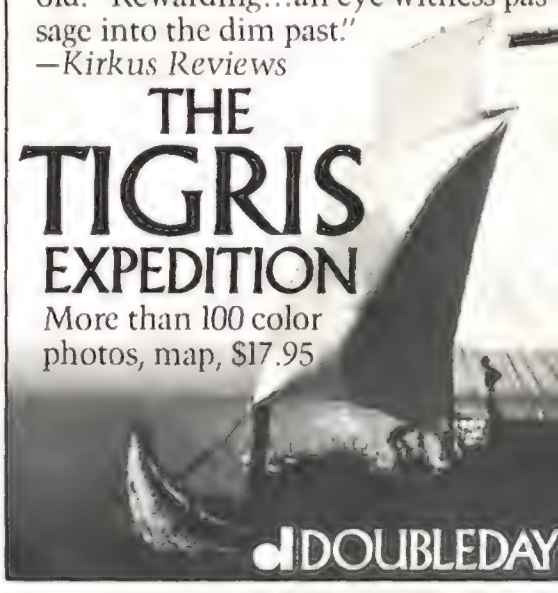

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40 was not included in the exhibition. In my opinion it is a forgery. Your use of it contributes to the confusion and doubt surrounding matters of authenticity in Rodin's work. Then, the caption stating "Rodin had this spacious studio built . . ." is incorrect. The photograph is a view of the Rodin museum built on the site of his studio at Meudon many years after his death. Finally, a reference to the bust on the cover was dropped into my discussion of Rodin's late, rough, private working studies in plaster. Actually the cover, an early, slickly conceived terra-cotta, illustrates a completely different aspect of Rodin's work.
Kirk Varnedoe
New York City

Dear Sir: Rodin's sculpture of hands, *The Cathedral*, bothers me [see below]. The pose suggests a pair, yet both are right hands.
Marion Fischer
Sun City, Arizona
Rodin thought hands very expressive and often modeled them, sometimes combining them playfully. This sculpture of two hands, a man's and a woman's, is an enlargement of one of those studies and represents the union of opposites—while at the same time suggesting to Rodin the strength and grace in the arching vault of a Gothic cathedral. Ed.

Rodin's *The Cathedral*, 1908

Magicians

Dear Sir: Many of the film-making and *Fantasmagorie* effects described may be outmoded for stage magic of today, but some of them, long forgotten or totally unknown to the younger generation, would be interesting to use in the modern field of the rock music show, which has a lot in common with both stage magic and multimedia special effects.
Seth K. Typhon
Bernardsville, New Jersey

Pipe dreams

Dear Sir: Philip Smith's article, "In pursuit of dream pipes . . . ," brought to mind a favorite clipping of mine, taken from a column of Walter Winchell's some 40 years ago: "S. Rayner, the Met Opera star, doesn't recall where he read it but 'Bad men want their women to be like cigarettes, slender and trim, all in a row to be selected at will, set aflame, and when the flame has subsided, discarded, only to select another. . . . The fastidious man wants his women to be like a cigar. They are more expensive, they make a better appearance, they last longer, for after all, if the brand is good they are seldom discarded, but used to the end. . . . The good man wants his women to be like his pipe—something he becomes attached to, knocks gently but lovingly, takes great care of always. A man will give you a cigarette, offer you a cigar, but he never shares his pipe.'"
George M. Feldner
Warwick, New York

Dear Sir: No medical evidence exists to prove the smoking of tobacco in any form produces an improvement in the ability for anyone to "dink," or think. On the contrary, smoking dulls the mind and nose, not to mention what it does to the heart and lungs. Pipe smokers are most offensive in meetings where people cannot escape and are forced to breathe the stench of burning rope. There is a difference between "dinking" and just plain old stinking.
William R. Doty
Wichita Falls, Texas

Ragbrai

Dear Sir: Thanks for the delightful bicycle article by Dora Jane Hamblin. No one but an Iowan could have understood

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the action, much less write it so well. The hint of "pot" or "hanky-panky" scandal on the ride gave me a laugh. Who'd have the strength after a day's wheeling?
George A. Wick
Sibley, Iowa

Dear Sir: Miss Hamblin clearly emphasized that RAGBRAI was not a bike race but an annual event reflecting the true spirit and tradition that still exists in Americans. It is one of my dreams to participate some day.
Mary Salvatierra
Phoenix, Arizona

View from the castle

Dear Sir: Referring to Mr. Ripley's column, the negotiations to end the War of American Independence would have taken even longer than they did if Franklin, Adams and the rest had gone to Ghent. Everyone else was in Paris. Since we enjoyed considerably more success at Paris than we did at Ghent in 1814, following the War of 1812, it seems worth getting the matter straight.
Norman H. Cooke
Chepachet, Rhode Island
To set the matter really straight, we would like to state that Secretary Ripley's manuscript did not contain a reference to the Treaty of Ghent. That was edited into his text in our offices and somehow slipped through the checking process. Ed.

Relief map

Dear Sir: To my knowledge, the only other relief map of the United States of comparable size is at Hillendale Museum in Mendenhall, Pennsylvania. Even though its horizontal scale is one inch to eight miles as opposed to Babson's one inch to four miles, the Hillendale Museum map does include part of southern Canada and northern Mexico. It too was constructed by that expert map builder, Anton Zenns.
J. Eric May
Mendenhall, Pennsylvania

Chiggers

Dear Sir: Since I scratched my first chigger bite about 25 years before E. F. Rivinus scratched his, I would like to comment on his statement that dabbing nail polish on the spot "may smother the

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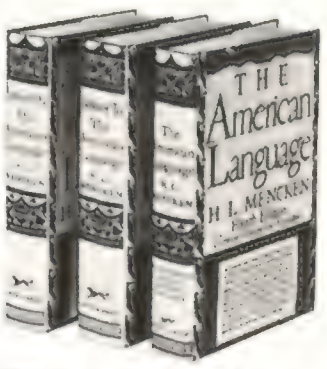

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chigger but will have [no] effect on the stylostome." Any itching is aggravated by friction. The application of nail polish provides a thin, flexible, impervious, smooth covering to the underlying welt. This protects from mechanical irritation by clothing. It does not alter the status of the chigger bite itself, but certainly alters the response of the host to this area of intolerable itching.
Tom D. Throckmorton, M.D.
Des Moines, Iowa

Dear Sir: While reading the article I was scratching the red marks left by my own city backyard chiggers. Staying in the city is invalid advice!
Doris C. Gross
San Jose, California

Dear Sir: E. F. Rivinus' chiggers brought back many tender memories of 45 years in Scouting, including this doggerel to the tune of "Polly-Wolly Doodle":

Oh—there—
was a little chigger
and he wasn't any bigger
Than the point of a very small pin—
But—the—
lump that he raises
just itches like blazes
And that's where the rub comes in!

William M. Bunting
Springfield, Virginia

Dear Sir: Ten tablets of brewers' yeast taken daily will effectively repel and prevent chigger bites. I used to be covered with them every summer. I haven't had any since taking the yeast.
Ed King
Spotsylvania, Virginia

Dear Sir: In Missouri I learned the best remedy once the chigger's got you—eight ounces of laundry starch in a full bathtub of hot water. Sit in there for 20 to 30 minutes, and all swelling and itching is gone for good!
Brix Dennison
New York City

Dear Sir: A bit of meat tenderizer mixed with water and applied to the afflicted area will break down the enzymes causing the misery. Repeat as needed. This also seems to work on bee stings and other insect bites. Try it—you'll like it!
Marilyn M. Jarck
Rock Hill, South Carolina

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For when one examines the features that truly matter in a luxury sedan—performance, craftsmanship and resale value—no other expensive automobile justifies its price quite so thoroughly as the BMW 733i.

Accounting, no doubt, for the fact that last year the demand for the BMW 733i outpaced even our most optimistic predictions.

EVOLUTION IS PREFERABLE TO REVOLUTION.

With a certain predictability, automakers reacted to the realities of the 1980's by bringing forth a plethora of "revolutionary" re-engineered cars.

The 733i, however, is hardly the result of a single year's rush to build an enlightened automobile.

Indeed, decades ago, when luxury car manufacturers were building ever larger cars, reckless in their consumption of fuel, BMW was championing such avant-garde concepts as six-cylinder engines, sensible piston displacements and impressive power-to-weight ratios.

The BMW 733i's 3.2-liter, fuel-injected power plant, for example, is the product of millions of miles of testing and refinement—on and off the great racecourses of the world.

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It would be difficult to imagine an appointment or an accessory that has been omitted in the BMW 733i.

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So impressive is the total result that one automotive journalist was moved to write of the BMW 733i, "...to drive it is to know all the wonderful things machines can do for man."

To arrange a thorough test drive, we suggest you phone your nearest BMW dealer at your convenience.

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The 733i (with standard transmission) delivers [16] EPA estimated mpg, 25 estimated highway mileage and, based on these figures, an estimated mpg range of [360] miles and a highway range of 562 miles. (Naturally, our fuel efficiency figures are for comparison purposes only. Your actual mileage and range may vary, depending on speed, weather and trip length. Your actual highway mileage and highway range will most likely be lower.) © 1981 BMW of North America, Inc. The BMW trademark and logo are registered trademarks of Bayerische Motoren Werke, A.G.

Around the Mall and beyond

On the assumption that anything dealing with the sky falls within the province of the National Air and Space Museum, the people over there had someone compile a list of popular songs which refer to the sun, moon and stars, also such nebulous matters as wind, clouds, rainbows and just plain sky. The list of titles goes back to 1920 and continues through the '60s. And to help celebrate the museum's fifth birthday, the Charlie Cliff Combo, a Washington group that likes to play these old tunes, gave two concerts and played a selection of them. I've been looking at what was available to Charlie.

The titles range from *Alabama Moon* (1920) to *Spirit in the Sky* (1969). That first one made me wonder how often the moon has been treated as a purely geographic phenomenon—something that occurs all over Alabama, but only in Pogo's part of Georgia, where the Suwannee River has its own moon. A little compiling on my own part showed that out of 125 songs about the moon, Alabama rates two. Florida has one, at least over Miami, according to a 1935 song. Indiana has one and a half moons, since it must share *Wabash Moon* (1931) with Illinois which lies along that river's western bank.

Kentucky's got two moons, and the South Seas, loosely designated, seems to claim four. Most places with moon songs are pretty much what you'd imagine: Texas, of course, Tennessee, Vermont, the Colorado River, the prairie. But Russia comes as a surprise. The moon seems too capitalistic, somehow, for a song about Russia. But in 1929—a lousy year for capitalists—some remarkable cosmopolite in Tin Pan Alley came up with *Underneath the Russian Moon.*

Other foreign lands with a moon are Italy, Burma, and both India and Bangladesh, considering that *Moonlight on the Ganges* (1926) will surely fall upon both nations. And, fortunately enough, the moon seems to be visible in the environs of Tin Pan Alley. Looking out of their fly-specked windows, the songsmiths were apparently able to make out a moon over Brooklyn in 1946, Harlem in 1932 and Madison Square, of all places, in 1940.

Alabama not only gets two moons, but apparently all the stars fell on it in 1934. No other geographical spot is so honored. Tennessee has its moon, and the sun also rises there according to *My Sunny Tennessee* of 1920. Four years later someone in the throes of nostalgia begged, *Cover Me Up With the Sunshine of Virginia.* There are similar evidences of sunshine in the Rockies, in Canada and, believe it or not, in California.

Nobody, during the 50 years covered by this survey, wanted to claim rainbows or clouds for his home state, local river or

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pet mountain. You'd think at least there might be a mention of rain-oriented phenomena in Scotland. Why not *There's a Special Darkness About the Clouds of Loch Ness* or *The Clouds Play Hanky-Panky o'er the Braes of Killiecrankie*? But no. No clouds. Not a hint of rain.

The wind, too, has had trouble getting assigned to a place in a song title. Nothing about Chicago, or Cape Horn. Just a snappy little number from 1942 called *When There's a Breeze on Lake Louise.*

Last May I mentioned an organization calling itself For Spacious Skies which is deeply concerned that not enough notice is paid to the sky and all its troubles. They had a meeting in Grand Canyon, incidentally, which was highly successful. But I have more good news for the members. In 50 years, 326 songs were written about the view overhead. That comes to about six and a half songs a year. Surely *somebody*'s looking up.

Samuel Finley Breese Morse, inventor of the telegraph, and Robert Fulton, developer of the steamboat, had a rather surprising thing in common: they were both artists. This is the theme of a book to be published this month which is the work of the former director of the Museum of American History—Brooke Hindle. He is now the museum's Senior Historian.

Hindle's new book, *Emulation and Invention,* plays with the inventive minds that flourished so richly in the 19th century and suggests that invention and art are related in a cousinly sort of way inside your head. Both are creative. Both rise from what Dr. Hindle calls the visual or spatial thought processes—which, in turn, spring from the right side of the brain. The left monitors verbal thought.

To get back to Morse and Fulton, the first frittered away a good deal of time at Yale, smoking cigars, drinking brandy and generally sporting around. But he did well in science classes and discovered that he enjoyed painting and was good at it. After graduation, Morse cut out for London and basked in the bright light of Benjamin West. This noted American artist, long a resident in England, had helped get a lot of bewildered American art students onto the right track.

Robert Fulton had been one of those protégés of West. Fulton had been a miniaturist in Philadelphia and wasn't particularly good with full-size canvases. He drifted off into mechanics, which had always interested him. He worked on mill machinery, underwater weapons, finally a steamboat with an improved engine. He executed the formal drawings for his engine, and other steamboat ideas.

Morse, on the other hand, kept doggedly pursuing art as a career, even though his exhibits of huge, single canvases failed. Only his portraits went over well and earned him a job as art professor (the first in the country) at New York University. Hindle says Morse hit upon the idea for an electromagnetic signaling device while aboard a ship returning from additional art study in Europe. When he noted his thoughts about this telegraph, he did so in wonderful little pencil sketches.

So the kinship between art and invention held up in these two men. Hindle says, "A single word that connects the two fields is *design.*" Watch for Hindle's *Emulation and Invention,* due this month from New York University Press.

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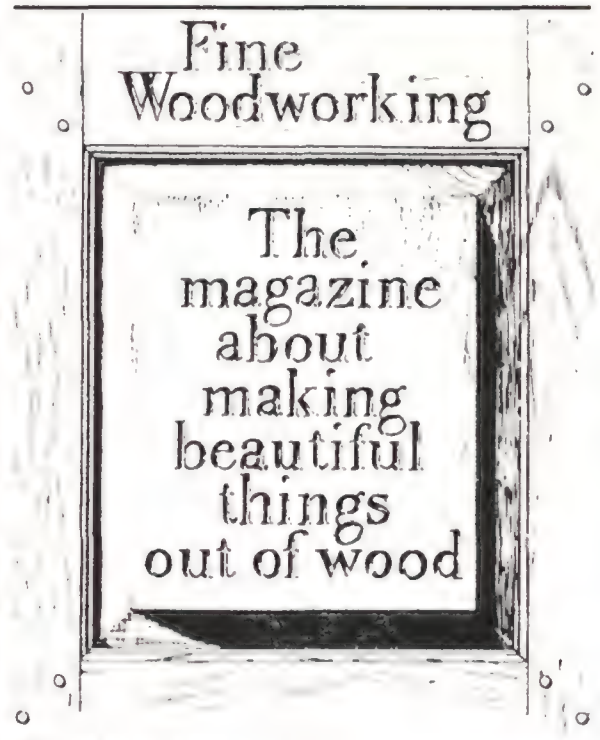

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The Smithsonian has kept a fatherly sort of watch on all the whoop-de-doo about the Battle of Yorktown. Next month will mark the 200th anniversary of the surrender of Lord Cornwallis in what proved to be the last major confrontation of the American Revolution. The Smithsonian has a symposium about Yorktown coming up next month, and is producing special radio programs about the battle and its meanings. This magazine will run an article about the siege and surrender next month. And of course the anniversary will get the full treatment at the little town on Virginia's York River where it all occurred.

Museums and libraries are lending treasures that refer to the event and will beef up the exhibit at Yorktown's state-run Victory Center (which is separate from the Park Service Visitor Center). Paintings are coming from France and Britain as well as U.S. galleries.

Virtually an entire army of costumed "soldiers" will take the parts of French, British, German and American troops, camping out at a great campsite where they will live as soldiers did 200 years ago. The President will be on hand with leaders of other nations that were involved.

All these goings-on made me wonder what earlier anniversaries of Yorktown were like. The 50th would have taken place in October 1831, but apparently nothing much happened. The reason was

Samuel F. B. Morse painted Lafayette in 1825, a year after his return to Yorktown.

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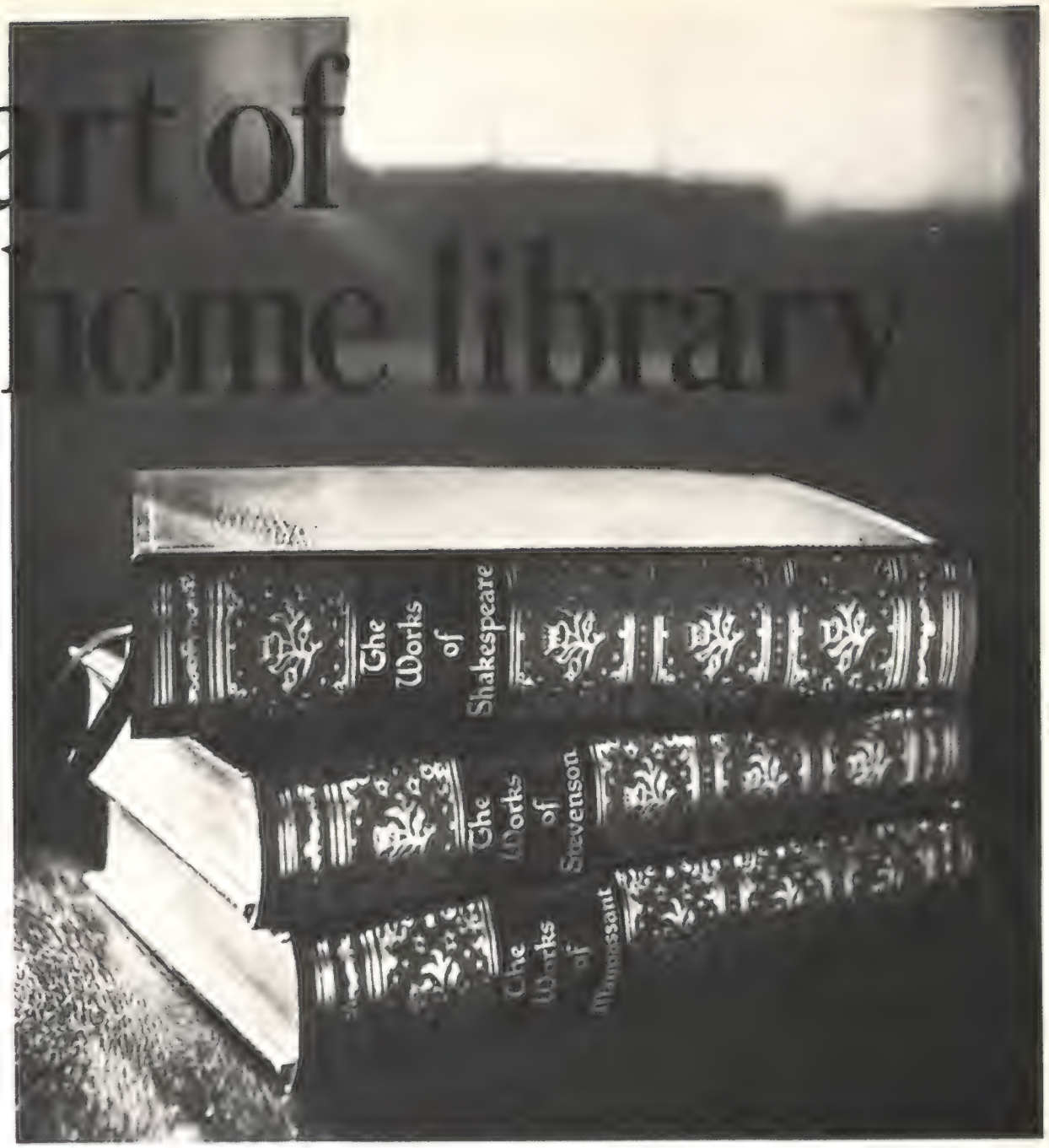

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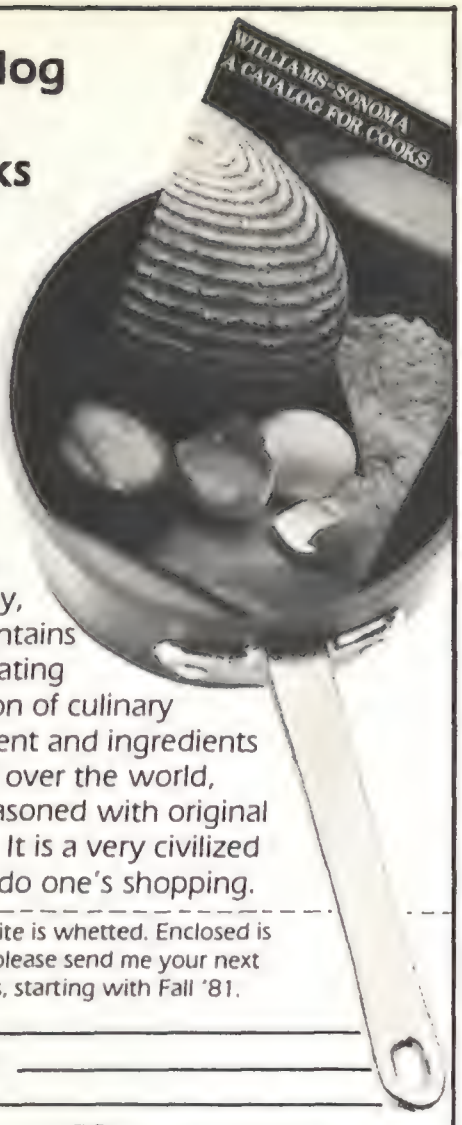

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that in 1824 the aging Marquis de Lafayette had returned to Yorktown where he had been very much a hero as a young man. The celebration then was lively enough to last quite a few years.

The Civil War provided further notice of the place because the Confederates, in 1862, fortified the town by simply refurbishing the trenchworks and redoubts that the British had constructed. In 1881, the centennial, the cornerstone for a tall monument was laid. The monument, suitably Victorian, still dominates the village. President Arthur spoke.

In 1931, the sesquicentennial year, President Hoover spoke, but not many people heard him, partly because it was a windy day and his speech all but blew away, and partly because the primitive public address system failed. General John Pershing probably heard every word because he was on the platform. After all, this was a Franco-American occasion, and Pershing was famous for having said, "Lafayette, we are here," when he led some of the first American officers to the tomb of the Marquis after the United States entered the Great War.

The French delegation at Yorktown was headed by Marshal Pétain, hero of Verdun. Prime Minister Pierre Laval was still en route to Washington for some disarmament talks. He and Pétain were brought together for the first time in the United States. A decade later, Pétain would be considered, sadly, the superannuated stooge who surrendered France to Hitler, and Laval would be marked as the scoundrel who set up the Vichy government, a puppet of Germany.

The British were represented by Lord Cornwallis (a bust of his ancestor was dedicated). The only German invited was a descendant of Baron von Steuben. He turned out to be a very old man, living in Berlin, and a younger descendant was accepted in his place. Many of the other foreign guests, mostly French, of course, bore the same family names as the dashing heroes of 1781 who had served with de Grasse and Rochambeau.

Hoover talked about French war debts to the United States—rather a sore subject. The battlefield was swamped with people, and despite the onslaught of the Depression, some 40,000 cars arrived, causing a traffic tie-up that Virginia police spent all night unraveling. A grand time was had by all.

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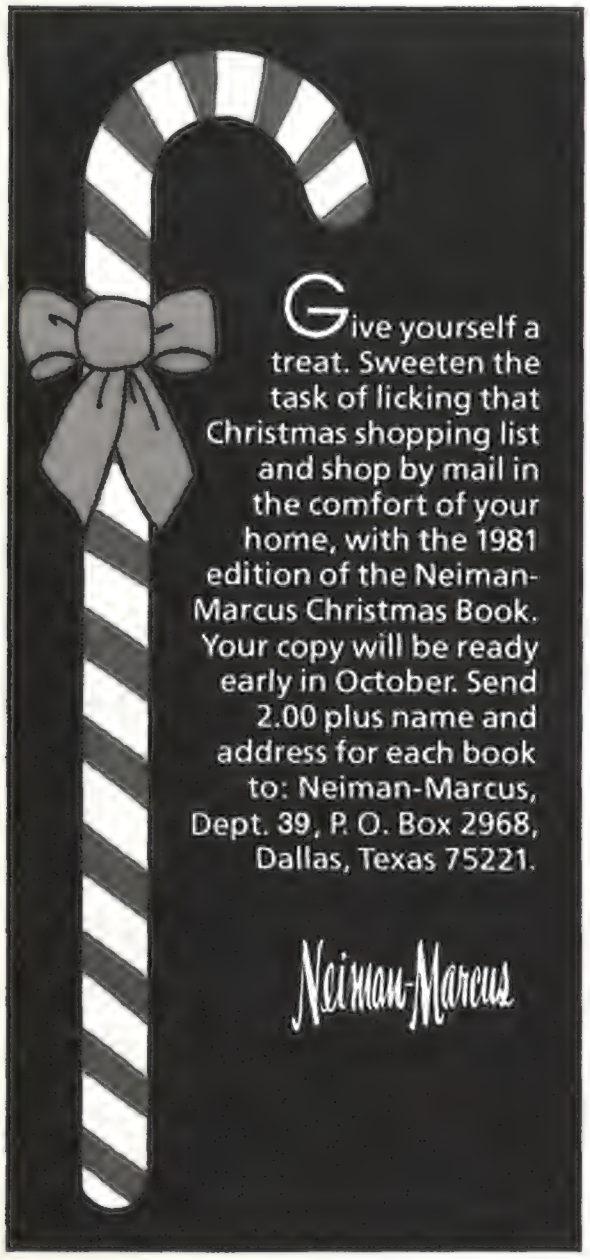

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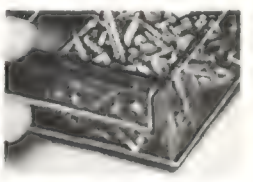

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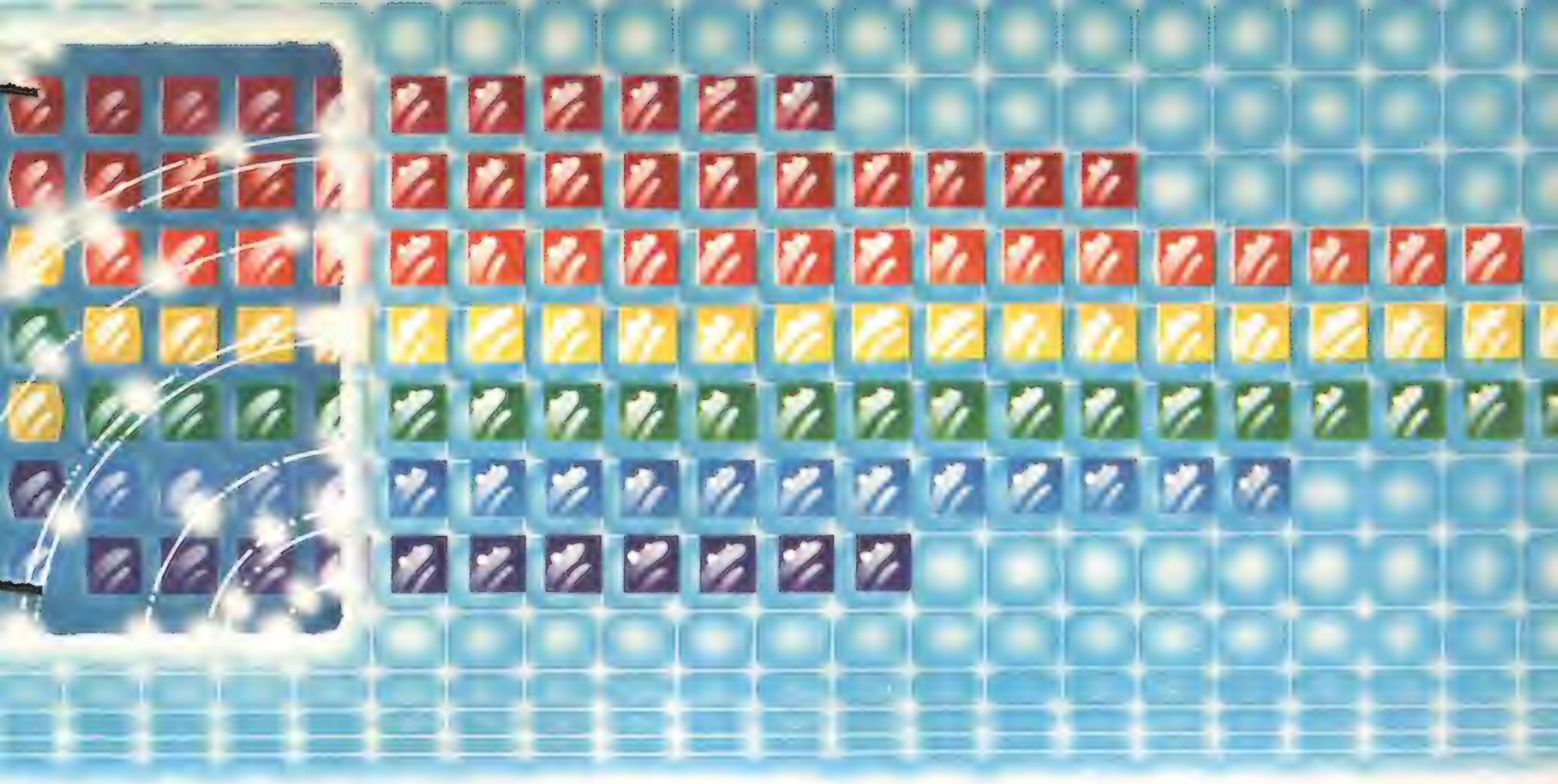

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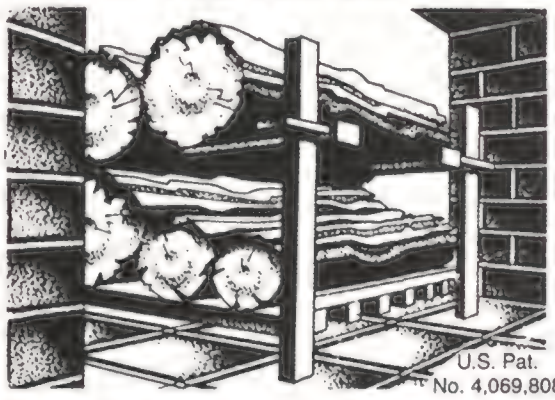

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For full scientific description, see L. Cranberg, Am. Jour. Physics, June '81. Reprints on request.

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Phenomena, comment and notes

At the top and the bottom, people worry about American agriculture—and some are doing things about it

The American food system is the envy of the world, and yet it may be living on borrowed time. People are worried that we are using up our topsoil and ground water ("spending capital," as they say), becoming dangerously dependent on fossil fuel inputs, and not only allowing but encouraging the concentration of food production into fewer and fewer hands. The surpluses that have plagued us since 1945 are coming to an end and world demand is rising.

In the words of Robert Rodale, it is the kind of thing that "could become a crisis before it even seems serious." Owner and editor of *Organic Gardening, Prevention* and *New Farm,* Rodale has been worried a long time. Now he is organizing something called the Cornucopia Project, an effort to involve citizens in finding out where we are and then doing something about it. The project moved from think tank to activism on a muggy weekend this summer, when 400 food activists showed up for its first symposium at Lehigh University in Pennsylvania. They came from churches and Congressional staffs, the American Meat Institute and Friends of the Earth, commercial farms and backyard gardens.

Medard Gabel, the intense, unflappable director of research for Buckminster Fuller, directs the project and opened the meeting. He has learned, he said, that the average molecule of food travels 1,300 miles to the consumer in this country, an

Sculpture shown much smaller than actual size. Sculpture is approximately 8" x 4-1/2"

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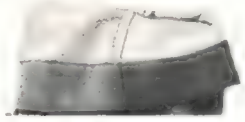

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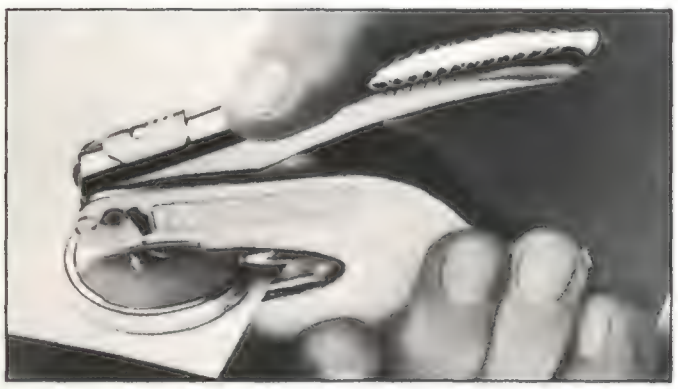

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arrangement obviously open to disruption. (A Cornucopia study of Pennsylvania found that the state "imports" more than 70 percent of its food, better than 6,500 truckloads a week, and pays more than $400 million a year just for the transportation costs.) *Business Week* is concerned, he said, that U.S. farm debt is now $180 billion and projected to rise to $600 billion by 1990, even though it is not at all clear where the money will come from or how farmers will pay the interest.

Soil erosion may be the scariest of all (SMITHSONIAN, March 1981). We're losing four billion tons of topsoil a year, according to R. Neil Sampson, a soil technician who is now executive vice president of the National Association of Conservation Districts and the author of *Farmland or Wasteland*, to be published next month. (Large numbers mean so little, but try to imagine one dump truck loaded with dark, rich loam, driving out of Iowa every 2.4 seconds, for an entire year.) We don't see it, he says, because fertilizers push yields up anyway. In an Idaho study, he said, "It seemed clear that maximum yield would come when the soil was gone."

Gabel said the Cornucopia Project had started when a group of Rodale Press writers and researchers sat down to figure out how to make U.S. agriculture more organic. But in the process of defining the American food system, they became

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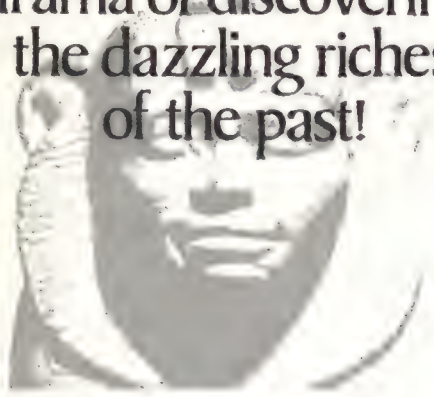

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fascinated with the broader question of whether it is sustainable. They thought not. Beneath their tables and charts, concern is passionate. Dr. Richard Harwood, the cherubic director of the Organic Gardening and Farming Research Center, gave a long, reasoned explanation of bioregional agriculture Sunday morning. He ended, however, with a call to arms: "We've got to recognize what is rape, pillage and plunder and once we recognize them, call them by their true names."

The Lehigh meeting was anything but an attack on present-day farmers, however. Wendell Berry, a poet and small-scale farmer (SMITHSONIAN, August 1980), took the farmers' side in his keynote address, calling them "old, overextended, and overworked." He quoted an old farmer: "If I were a young man, you couldn't give me a farm," and repeated the apocryphal tale of a farmer who wins a million dollars in a state lottery. A reporter rushes out to ask what he will do, and the farmer replies: "Keep farming until the money runs out."

The Cornucopia Project is an attempt, Berry said, to get people to take back the responsibility for their food supply, the agricultural proxy that city people have given to farmers. We have turned over what we think of as "low work " to other people, he said, in the belief that this will free us to turn out great art and other, more important, accomplishments. But we cannot expect great art from a people who cannot farm well, he contended, or cook well or sew well.

Production pressures have led to industrial farming, which Berry defined as "the subjugation of the biological to the mechanical and economic." It is a disconnection, a disintegration, he said, and the life expectancy of present-day farming is short.

These worries are not restricted to some fringe element. Last January outgoing Agriculture Secretary Bob Bergland, a grass-seed farmer from Minnesota, and his staff took their own look at American farming and produced a study called: "A Time to Choose." It makes recommendations like these:

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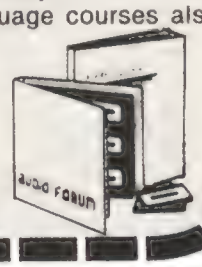

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must recognize the costs to society that are the consequences of unnecessary concentration. . . ."

And a July 1980 study of organic farming methods by USDA teetered on the brink of encouragement. "Some features of organic farming have favorable implications for agriculture and could encourage increased future use of certain concepts and practices," the report says. The department rightly points out that it and the land-grant universities have been pushing for 50 years techniques now identified as organic: recycling organic wastes, green manure crops and crop rotation. In several areas the report sees a future combination of conventional and organic systems.

The study noted organic farmers use less energy, have lower costs and suffer less erosion. (Because of similar objectives, problems and practices, it turns out, they also have a great deal to offer small-scale farmers in developing countries.) Communication is a problem, the report explains: "Many agricultural scientists, Extension workers and farmers strongly believe that organic farming is impractical or infeasible. To some extent, these views are the result of misperceptions and misunderstandings about the contemporary character of organic farming. Similarly, agricultural policymakers are not fully aware of the environmental, conservation and energy-related benefits of organic farming."

At Lehigh no one was waiting for the government. By show of hands, everyone there was a producer as well as consumer. (I raised my hand on the strength of some ancient grapevines and apple trees.) Backyard gardens are significant: the Gallup Organization found that in 1980 some 34 million home gardens produced 20 billion pounds of food (some of those gardens must have been phenomenal). Retail value: $15 billion, about ten percent of the national total.

The participants were concerned about urban community gardens (SMITHSONIAN, August 1974), especially for the poor and the aged. Fewer than a quarter of the 40,000 community gardens in this country are under any arrangement permanent enough to encourage soil building, perennial crops and so on. Another major concern was better marketing arrangements for small growers, the sine qua non of a local agriculture.

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A taste of what can be done came from Lindsay Jones and the Agricultural Marketing Project. Her group started in church parking lots in Nashville, she said, and now sponsors farmers' markets they call food fairs in 80 towns and cities in Tennessee, North Carolina, Georgia and Alabama. She herself is about to step out to start farming in North Carolina.

Two things struck me about the men and women who came to Lehigh. One was an almost universal self-confidence, an air of people who were already accustomed to doing things for themselves. A lot of theories were bandied about, but no one was only a theorist. The other was the prevalence of people who enlisted the help of churches, even if it was only to use their parking lots for farmers' markets or their land for community gardens. But ministers were there, too, ministers who turn from the pulpit to the dirt, carrying on a mandate that was old when the first plow turned American topsoil: feed the hungry.

What now for the Cornucopia Project? The next stop is Holt, Michigan, where Rodale and some of his people will speak at a two-day session on local and personal self-sufficiency September 12 and 13 at Holt High School, presented by the Federated Organic Clubs of Michigan. (Details from Daniele and Richard Ferris, 3565 S. Onondaga Road, Eaton Rapids, Michigan 48827.) Cornucopia symposiums on the West Coast and another in the Lehigh Valley will follow next year. More studies of state and regional food systems will appear (manuals on how to do such studies are in the works). Newsletters will report their research results, new ideas, successes.

The project is designed to be a two-way street. Rodale and Gabel stressed that they are wide open to ideas, reactions, suggestions. They can be reached at the Cornucopia Project, Emmaus, Pennsylvania 18049.

But the real results will be hard to see. Individuals who start growing their own. Activists who persuade local governments and neighborhoods to provide direct markets for farmers. Co-ops and buying clubs that contract with local farmers, guaranteeing them a market. Promotions for local products. Small stuff. Will it matter? There are those who think it will, that it will matter very much.

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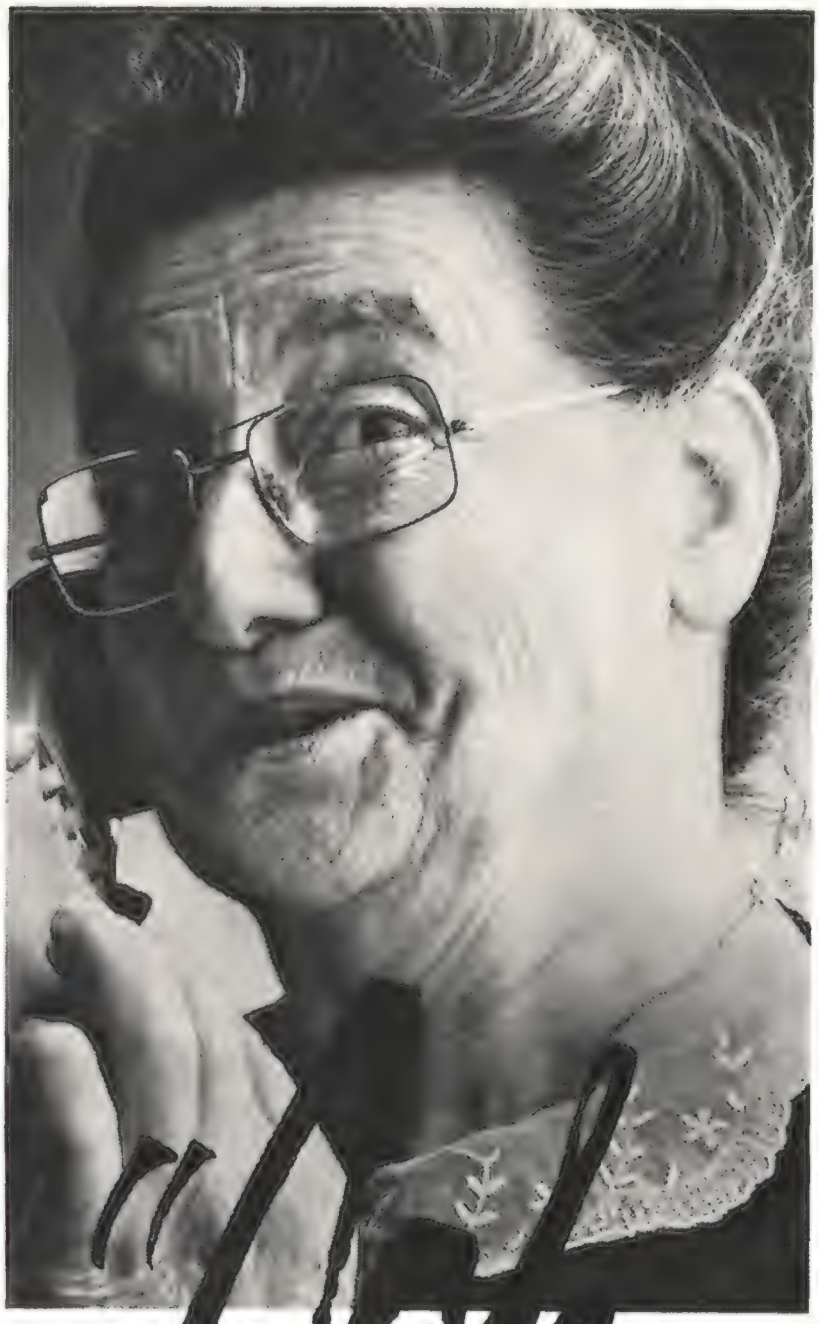

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In 1439, British and French negotiators gathered at Calais to discuss truce terms to stanch the Hundred Years' War, already 102 years old and counting. During a lull in the discussions, the participants took to the field for a friendly game of football. That was their first mistake.

The Archbishop of Rheims, the French chancellor, dived into a scrimmage pileup and came out with a "shinner," a painful leg bruise. But the real blow was probably to ecclesiastical decorum. It is hard to take anyone seriously who is wearing a miter and hopping around on just one pin. As for the other mistakes engendered by the conference, the bottom line is this: the war continued for 14 more years.

By contrast, that barely organized warfare known as medieval football had been going on for centuries at that time. Herodotus tells that balls were invented by the king of the Lydians as a diversion for his people during a famine. (Think of that the next time you buy a wan stadium hot dog.) Over the ages, ancient ball games developed according to the size of the ball; also whether the ball was to be hit or caught with a racket, a bat, the hands or the feet.

Some unacknowledged genius, who stipulated the ball could be either kicked or picked up and run with across an imaginary goal line, invented medieval football. In practice, the game must have come to resemble modern rugby. But it was not until the 19th century that football evolved into its distinct types: soccer (what the British more properly call association football, in which the hands may not touch the ball); rugby (a back formation from soccer in which the players can pick up the ball); and American football (a highly patterned form of rugby, in which the action stops after each play and players are padded).

Although the game reminds one of rugby, medieval football was played on a much larger scale. It was a team sport in the broadest sense: whole villages formed sides to contend for either a ball or another totem—a bull's head, say, or a flitch of bacon. The winners would bear home the prize and would be acknowledged as victors, until the next game.

Football owes its origin to seasonal festivals, whose modest purpose was to bring together village and manor tenants for communal work, such as harvesting or sowing, shearing or slaughtering. The game was a kind of reward for work well done. But it also served darker, sacrificial purposes. In a game called Haxey Hood, played at Lincolnshire, England, in the 13th century, teams of villagers strove to gain possession of a coil of rope encased in a sack (the "Hood") and return it to their homes. Anthropologist Edwin O. James regards this game as a reflection of the annual "struggle between winter and spring." To James, "It seems very likely that originally the Hood was the half or head of a bull sacrificed to fertilize the newly ploughed fields and, therefore, eagerly sought by those who could secure it to vitalize their crops." The ceremony before the game included a speech in the town churchyard that riled up the populace before they rushed to the fields to tussle for the real or imagined bullock head.

Football itself has been firmly associated with the springtime festival of Shrove Tuesday in numerous accounts from throughout medieval England. In Chester, the shoemakers' guild donated the leather ball for the annual game; the town hall was designated as the "goal line." In 1540, because of the violence associated with the game, it was replaced by a simple footrace from a nearby road crossing to the town hall. Shrovetide (springtime) ball games in the fields near London were recorded in the 13th century. At that time, football was an afternoon diversion, an energetic capper to a morning at the Shrovetide cockfights.

Special subsets of participants were sometimes involved. At times, only guild members or apprentices contended. At Inverness, Scotland, the annual football game pitted married women against the single girls. Variants continued to be played well into the 20th century. On

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February 13, 1923, a game was played at the Duke of Northumberland's Alnwick Castle. According to an eyewitness, the opposing sides were the two parishes of St. Michael's and St. Paul's. At Ashbourne, Derbyshire, the "Up-Towners" played the "Down-Towners." The goals were three miles apart and the course crossed a river. The whole town played.

This sort of communal participation seems to have been the single most important feature of early football. A victory was apparently taken as insurance that a good growing season and harvest would follow the spring planting. A similar game, of ancient origin, is still played in Afghanistan. Called *buzkashi,* its object is to gain control of a carcass of a goat or calf and carry it across a designated goal line. Described as barely organized chaos (involving up to 1,000 players), it aptly demonstrates the violence into which football could descend.

Moreover, the violence associated with football seems to derive not only from its agricultural past but also from much more arcane anthropological traditions, including the custom of kicking around the head of a deposed ruler. Thus, in the 18th century, a motion to discontinue the troublesome Shrove Tuesday football game at Kingston-upon-Thames was put down under the assertion that the players were commemorating an ancient victory over the Danes. It was said that the people kicked the decapitated king's head about the town in derision.

A 14th-century poem tells us that the members of King Arthur's court played football with the decapitated head of the mysterious Green Knight. He, of course, gets the last laugh, as he casually bends down, grabs his own head, replaces it on his shoulders and rides off into the night.

In France, the game was played with a ball of bran or hay that was delivered by the lord of the manor to the field hands. The communal spirit was also important there, too, as in England, for it often pitted age groups, parishes, sexes or clergy and laity against one another to bear home the prizes awarded the victors. The game was called *la soule* or *soulette* and resulted in the same unpredictable violence and mayhem as described in England. In Italy, the game is recorded as having been played in the arena at Padua, as a kind of Lenten festival, involving 20 to 40 players. Perhaps the fact

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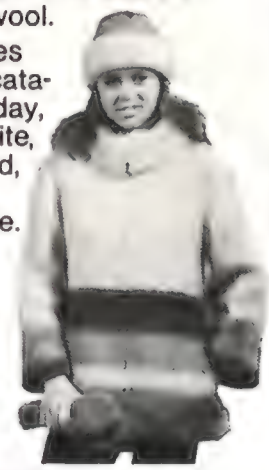

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that it was played in old Roman amphitheaters, ensuring a more circumscribed locale for the Italian version of the game, accounts for its reputation as a more civilized pastime than elsewhere.

Numerous records reflect how dangerous these early games could be. In 1303, an Oxford student and footballer was killed during a game on High Street. In 1321, Canon William de Spalding was absolved by Pope John XXII for accidentally killing a lay friend of his who fell against his sheathed knife during a football game. In 1381, fines were set against the organizers of a football game for the tenants at Southwick and Wearmouth. It was said that the game was the occasion of "grievous contention and contumely." In 1409, London forbade the collecting of money for new Shrovetide footballs.

During the two centuries between 1300 and 1500, attacks on the game began to mount. Royal decrees were leveled at the game, obviously with little success, in 1314, 1349, 1389, 1401, 1457 and 1491. St. Andrews University of Scotland, which allowed the sport of hawking, utterly forbade football to its students. In 1518, the archbishop of Dublin set an 80-pence fine for clerks who played football.

In spite of such widespread condemnation, however, football prospered. As a 19th-century historian suggests, the unadorned "rush and struggle of the rude and manly game" was the key to its survival. As testimony to its popularity, the game is enshrined still today in several undeniably medieval settings. A 14th-century woodcarving in Gloucester Cathedral shows two youths contending for a ball. One player is about to punt. In the medieval folk song, *Sir Hugh*, the play is reminiscent of Pelé:

He kick'd the ba' with his right foot,
And catch'd it wi' his knee.

Despite all its dangers, medieval sport had no referee. We must have been different back then. Certainly medieval Man came from a sporting tradition. Plato and Homer encouraged play. A Roman tablet in Carthage records: *"Venari, lavari, ludere, ridere,* [*hoc*] *est vivere"*—to hunt, to bathe, to play, to laugh, that is to live. Even the dour St. Thomas Aquinas smiled on sport.

Obviously there were enough redeeming features of the ancient harvest-time sport to excuse the occasional carnage. As Edwin O. James observed: "From the

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cradle to the grave, and from season to season, in the primitive and peasant cultures the entire group, domestic and social, has been united as a harmonious whole in a common activity, welded together by collective emotions as a corporate unified entity."

No doubt the expectation of competition, enjoyment and satisfaction that sports afforded played an important role in bringing the people together for their feudal and agricultural duties. The absence of such a legitimate underlying rationale is perhaps what causes the problems we see today in the game. In any case, those problems have been a long time building. In 1598, a Puritan regarded football in this light: "as rather a friendlie kind of fyghte than a play or recreation . . . for doth not everyone lye in waight for his adversarie seeking to overthrow him and picke him on his nose, though it be on hard stones, on ditch or dale on valley or hill . . . he careth not, so he have him downe. . . .?"

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Michael Olmert

Points of Origin, *a new column tracing the roots of some of our modern customs, will appear periodically in this space.*

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By Paul Trachtman

A generation meets computers on the playing fields of Atari

Computer games, played in arcades like this one in Massachusetts, are becoming a new national sport.

The 'intelligent' machines in game arcades are skillful teachers who never let you win, but always let you learn to do better

"It's easy to get isolated and become a hermit with computers," a young games programmer named Dave had told me the night before. We were in his den, with starfields exploding on the screen of his desk-top Atari 800, and the world ending in a shower of nuclear warheads on the upright Missile Command module in the corner, its computer patiently playing against itself in the absence of a human opponent. Now, the morning after, we are entering the hermitage.

The sun that once ripened apricots here is rising over California's "Silicon Valley," an area south of San Francisco Bay where computer plants now thrive in industrial parks. Inside the engineering headquarters of Atari, the world's first manufacturer of coin-operated video games, Dave finds a computer printout waiting for him on his desk. His office space is a paneled cell, as fit for contemplation as the cells of medieval hermits, with a small chalk board on one wall. He studies the printout to see whether the corrections he requested have been added to his program, a still sketchy set of instructions for a new game he is working on. Then he has his first brainstorm of the morning, grabs pencil and paper and begins writing:

"Multi monster sequence. Every other wave: no friend. For each attack IF timer equals 4 THEN 'too slow,' exit monster mode. After monster is zapped, IF timer is 4 THEN reinitialize monster mode."

"Is that programming language?" I ask. "Oh no," he says. "It's plain English."

I have a feeling that I've been zapped.

"We're making technology transparent"

To most of us outside the computer culture, its initiates seem to live in a world so alien that they might as well be medieval hermits, or in some other time warp of their own. They appear in a popular campus poster as "nerds," whose heads are the only thing about them not screwed on backwards. But Dave is hardly a nerd. If anything, he is still the mischievous kid with tousled blond hair who liked physics and chemistry in high school but didn't like the titration experiments. "I liked to make the bombs and flares and stuff," he says. Only now he is making them into electronic fantasies, and is far happier than in the days when he worked for Bunker Ramo or National Semiconductor developing computerized check-out systems for supermarkets.

He is working now at designing coin-operated video games, among people who see technology itself as a game. "We're making technology essentially transparent," one Atarian says. "We're making it friendly," says another. "That has not been the point of view of the big business systems, or the military computer business, and it gives us an advantage in going into

Photographs by Dan McCoy

Dave, programmer who developed Missile Command, contemplates next move in a new electronic game.

Atari engineers and programmers wait turns at an unfinished game as one "tests" it in the lab.

the electronic home that will emerge in the Eighties."

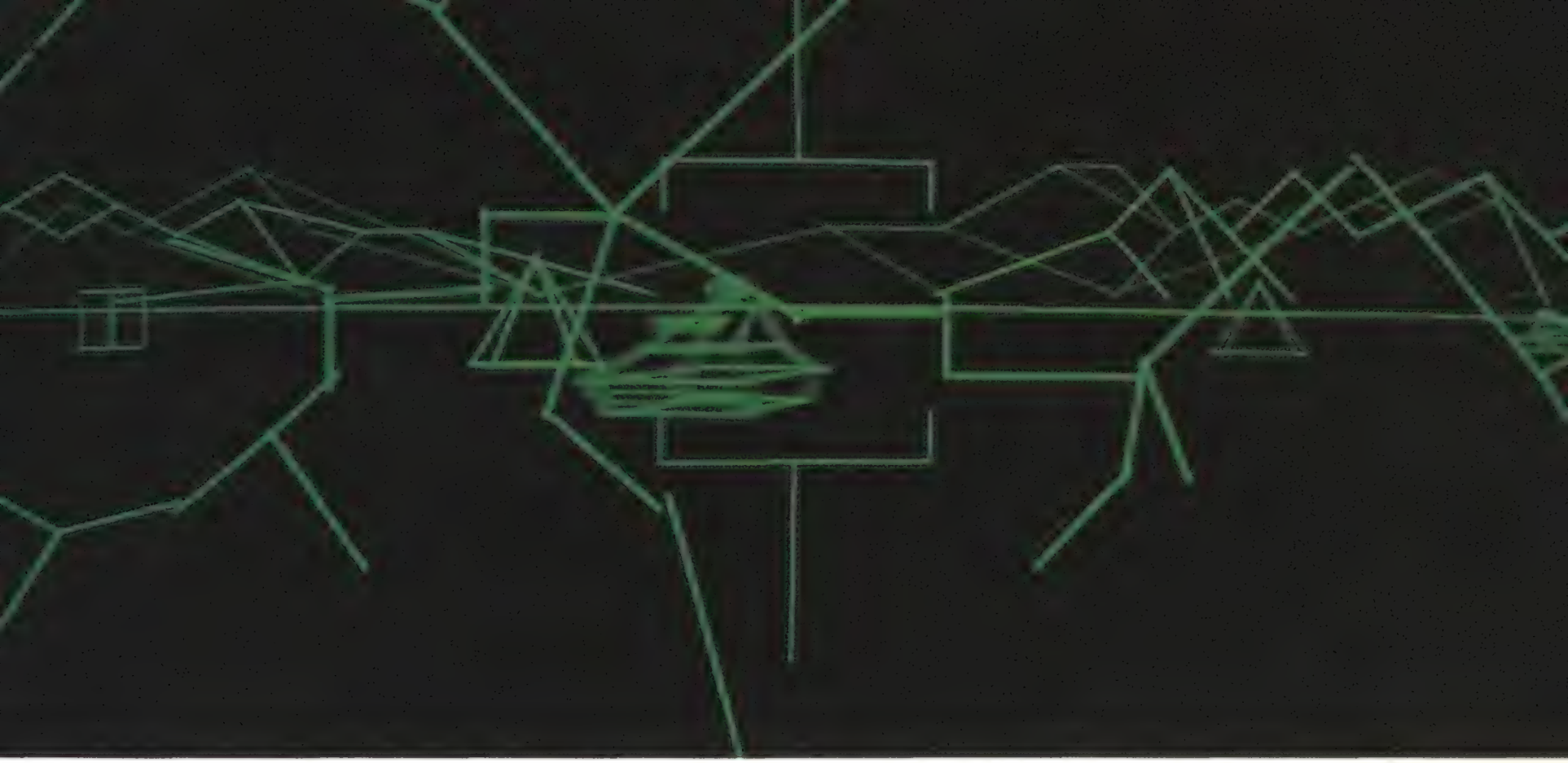
Arcade video games have made Atari a major new player in the entertainment empire known as Warner Communications. A 1980 market research survey by Atari showed that 86 percent of the U.S. population between the ages of 13 and 20 has played some arcade video games, and estimated that Americans are spending $2.5 billion a year on them. They have spread so rapidly that they have taken the culture by surprise. Not even the players seem to know quite what to make of them, or why they are so appealing. Kids whose attention span approaches zero in schools spend long hours at apparently repetitive tasks on these machines, improving their skills. The players frequently describe themselves as addicts and junkies. MIT sociologist Sherry Turkle reports that some business executives she has interviewed in the game arcades compare the experience of playing these games to transcendental meditation.

Inside the engineering labs and offices at Atari there is a similar air of excitement and inspiration. Everyone here seems to feel that computers are going to play a much friendlier role in our lives than most people ever expected. The image of the large, centralized computers that make impersonal organizations even more impersonal, that insist on their own billing errors and whose superior mentalities seem best suited to writing junk mail, are not the kinds of computers Atarians have in mind. And their perceptions seem to be based on their own experiences. "People aren't going to be able to be scared of computers very much longer," one young games programmer assures me.

Dave takes me a short distance down a corridor lined with numbered lab doors. Behind them are the video games of the future, in various stages of development from a few blips and squiggles on video monitors hooked up to rows of printed circuit boards, to advanced mock-ups in cardboard skins, with display panels that blaze into action when anyone hits the start button. Most of the time, someone has. Dave pulls his chair up to a video tube next to a computer, types in a few instructions and begins to play his new game, intently twisting a control knob and hitting the fire button, avoiding electric bolts and zapping monsters, no longer talking to me and unaware of the pack of other programmers and engineers gathering at his back to wait a turn at the game. Some of them haven't had breakfast yet.

They are doing what other people are putting millions of coins a day into video-game machines to do in arcades around the world. "I have a terrible time going home some nights and telling my wife that I've

The author, on SMITHSONIAN*'s editorial board, admits as a computer game player he is beaten but unbowed.*



Players' view shows enemy tank almost lined up in gunsight on screen of the game Battlezone. Arcade version has been modified by the Army to test in training gunners for new Infantry Fighting Vehicle.

worked for a living," one of the pack admits. "For me," says another, "a tough day is trying to find those two little bugs in my game, so I spend hours playing it. Sometime, of course, you have to spend hours pushing a pencil. And for most people here, pushing a pencil is the most aggravating thing they could do."

Other labs are springing to life now, as more programmers and engineers say hello to their computers and ask what is on their simulated minds. Pushing open a door, I step into an unearthly greenhouse sprouting wires that climb the walls like clematis vines. An engineer who looks more like the gardener in faded jeans and boots is hunched almost into a video tube, his shirttails mentally flying as the computer bests him. Suddenly he pounds the control panel with his fists. "We stress-test all our games pretty thoroughly before they leave here," he announces wryly.

Across the lab, a programmer in blue bib overalls is scratching a bird's nest of hair and swearing at his computer. On a shelf in front of him, a little vehicle has just gone haywire on the graphics display monitor. He types out a new instruction, pushes a control button, and watches intently. "It disappeared!" he sputters. "I know I didn't blow it up, so something else blew up! Like the program!"

The gardener comes over to commiserate. "Is it breaking down?" he asks. "It hasn't become sane yet!" the programmer moans. "I have yet to convince it to speak anything that's even a semblance of reality!"

One door down, things are working better. A wavy-haired woman in rosy velour and jeans spins a control ball with long slender fingers to move images around the screen. Dona may go down in the annals of computer science as the programmer who turned animations of centipedes and spiders into objects of female fantasy. "I'm convinced my game is a woman's game," she says, with a soft Arkansas laugh. "It's a nice game. It's very straightforward."

Like Dave, who yearned to work for Atari from the moment he saw the original Pong game in a bar, Dona was drawn to Atari by playing games in an arcade. She was working at General Motors' Delco plant in Santa Barbara, programming a microprocessor to govern such things as idle speed, spark advance and cruise control in the 1981 Cadillac. But GM's assembly-line approach to programming was frustrating ("Sometimes even two programmers is one too many") and the days were dull. "At GM, you could whisper if you had to, but don't talk, and for God's sake, don't laugh," she says.

So she escaped to a nearby arcade at lunchtime, out of boredom: "I knew about the Silicon Valley, everybody talked about it, but I read somewhere about Atari being up here and it just dawned on me: 'They make these games. What they do every day is what I do every day, but look what they get out of it. I get Cadillacs and they get these!' "

What is it about these games? When Asteroids was still in the lab, on its way to becoming Atari's most popular game ever, Lyle was the force who helped make it work. "I was also," he admits, "the original Asteroids junkie. By junkie I mean I would go into the lab after work at five or six in the evening and start playing Asteroids, and when I would finally snap out

In an Atari chip design lab, "logic" expert checks every circuit by hand before diagram is miniaturized and engraved onto tiny chip (foreground) for game.

of my trance it would be eleven at night, and I'd say, one more game, and when I snapped out again, it was two in the morning, and I knew I was in trouble. If I counted what it would have cost me in quarters, I would have spent several thousand dollars playing Asteroids."

A strange thing is going on here. These people are being changed by the computers they work with. They love the machines, bugs and all. It's not just the games, nor the engineering personality's desire for logic and order that makes these computers so stimulating: it's their size. They've got small enough to become individuals. These programmers are no longer working with systems. They are working with friends. They are on such intimate terms that they swear at them, hit them, even laugh with them. What is strangest, though, is that they seem to bear no resemblance to those human cyborgs science-fiction writers warned we would become once the computers got hold of us. Instead, these people seem to be having a hell of a time.

Trying to explain, Dona talks about her microprocessor with a romantic passion that men don't always inspire. "In the Valley, almost everybody has something to do with computers, and some people think I'm just frittering my life away here," she says without a blush. "A lot of them work on IBM 370s and that kind of thing, and they can't fathom what it is to have the whole little thing to yourself!"

"The computer is a pal that doesn't get mad"

What's really going on here? Before coming to Atari I had asked Isaac Asimov, a pioneer in science fiction, why he thought these games were so attractive. "Kids like the computer because it plays back," he said. "You can play with it, but it is completely under your control, it's a pal, a friend, but it doesn't get mad, it doesn't say 'I won't play,' and it doesn't break the rules. What kid wouldn't want that?" That sense of being in control seems to be something Atari programmers enjoy as much as the players. Indeed, there are cognitive psychologists like James McConnell at the University of Michigan who think our most basic drive is an urge to get the environment under control.

McConnell describes behavior in terms of feedback terminology: "The nice thing about using computers is that you can establish control over your inputs, which allows you then to control your outputs." In other words, if you control the challenge or reward, you can improve your performance. McConnell's language is remarkably similar to what one of Atari's electronics engineers said to me, as he was explaining how a game works: "Essentially we have a microprocessor and input-output devices. All these games are, is process control. You take some kinds of inputs

and you generate some kinds of outputs, and it's a feedback system, and the player is in the loop of the feedback, and while he's giving the feedback to the game, we hope he's getting some kind of enjoyment out of it."

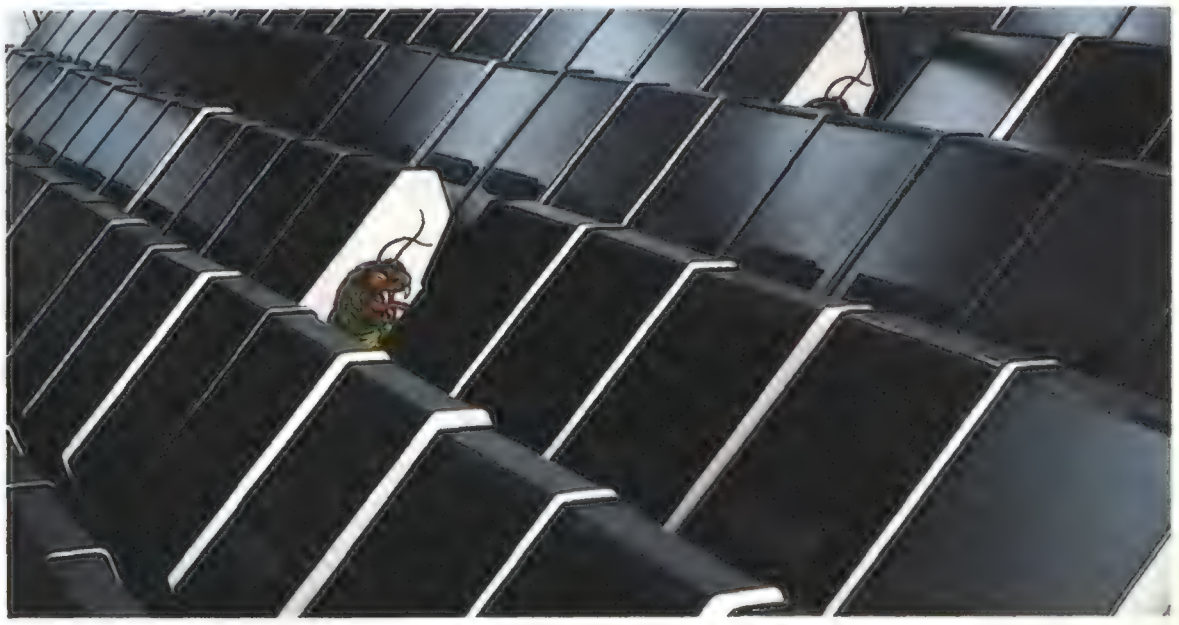
Which is how it all began, in the mind of Nolan Bushnell. A big, vigorous man with playful eyes who keeps a painted wooden clown and mounted papier-mâché zebra head in his office at his new robot-and-fast-food enterprise, Pizza Time Theatre, Bushnell is the man who figured out how to get the rest of us to love the computer, and who started Atari to do it.

He first got the idea of video arcade games as an undergraduate at the University of Utah, where he played Spacewar games on the engineering lab computers at night, and supported himself by working at an amusement park in the summertime. It was while trying to convince strollers to toss baseballs at milk bottles to win stuffed animals they didn't really want, he recalls, that he realized what an attraction the engineering lab computer games would be on a midway. "But when you divide 25 cents into an eight-million-dollar computer, there ain't no way," he says, "so I sort of filed that concept in the back of my mind."

In only a few years, however, the price of minicomputers came down so far that Bushnell, with a bit of electronics ingenuity, almost had the hardware for an arcade game worked out, using one minicomputer hooked to several TV terminals. The minicomputer was not quite powerful enough, so Bushnell added more computer circuits to the terminals to keep track of specific things, and he kept making the terminals' hardware smarter. Then he had a 25-cent idea. "I said, 'Hey, maybe I can do it all in hardware, and have a stand-alone terminal. And the minute that happened I worked it out, and the economics were overwhelming. That was really how the first video game started."

That 25-cent idea changed the history of the computer, but no one knew it at the time. The legend is that Bushnell built the first game, Pong, in his garage. Actually, he moved his daughter out of her bedroom to build it, and it wasn't Pong. The first was a game called Computer Space, a flying saucer and rocket ship dogfight with turn, thrust and fire buttons, in a fiber glass cabinet. "The rocket ship followed Newton's third law—action and reaction—to ten percent accuracy," Bushnell says. Only 2,000 were made, but it was enough of a success to encourage Bushnell to build his next game, Pong, which became so popular and so widely distributed that almost everyone could get his hands on the hardware.

The games were marketed through the traditional distributors of pinball machines and still are, except that they now make up about 80 percent of the business in many places. Many distributors at first showed no interest, and most thought the games would make a brief splash, then disappear from the market. The distributors still don't know quite what happened, or why. Despite an initial appearance in places where pinball was played, which led many people to see these games simply as a new sort of electronic pinball, the computer games are as different from pinball as the iron horse was from the horse. Pinball is essentially a game in which the player matches mechanical skills with a machine. It is the natural plaything of the industrial revolution, in which machines created a mechanical advantage over human labor. The computer games are the first playthings of an information rev-



On Atari production line (left), assembler inserts chips in circuit board, the "brains" of new game, while rows of cases for game (above) await assembly.

John McDermott/Rainbow

Nolan Bushnell, who dreamed up video arcade game, now makes robots for his new Pizza Time Theatre.

olution, games in which the player matches wits with an intelligent machine.

They may also turn out to be more than that. With the continuing decrease in the cost of the hardware, the games have got more and more sophisticated. A recent Atari game called Battlezone has three processors running it. In order to play some of these games, many players develop styles of thinking and seeing that they do not ordinarily use.

Out in the arcades now, MIT sociologist Sherry Turkle has been watching the players. "I think they are learning a lot of spatial thinking, a lot of geometrical thinking," she says. "What I see is an experience that great athletes have, where they can allow their bodies to think for them. The games are giving that experience to larger numbers of people. With good players their fingers are doing the thinking." The games are also teaching a lot of people that computers can be playful, she points out.

At the Claremont Graduate School in a Los Angeles suburb, psychologist Robert S. Gable suspects that the players he sees in the arcades may be thinking with faculties even more surprising than their fingers. "The game players are intellectual and social mutants," he says. He sees their play as a form of learning that may be more suited to the computer-based society that is emerging than the linear education now available in schools and books. "The arcade machines are skillful teachers," Gable says, "with more variety and individuality than many human teachers."

His words are echoed by Michigan's James McConnell, whose introductory textbook on psychology is currently a best seller on college campuses. "Go into one of the arcades and watch the students there play," McConnell advises. "They're being challenged in strange sorts of ways, and they're vocal and emotional about it. And then go to the library, and watch the kids sitting in a row, and they aren't smiling and they aren't enjoying anything, and if they did, if one of them got an insight from reading a book and stood up and yelled 'Eureka!' they'd throw him right out of the place."

Are those psychologists saying the arcades are the new schools for survival? Is it somehow more valuable to learn Missile Command than to learn English?

To know that, you may have to hit hyperspace. Hyperspace is a concept introduced in early science fiction and used in some of the first computer video games, whereby you disappear from your current frame of reference and reappear in the same world but in a different dimension of space or time, or at least at different coordinates on the screen. It is not a perfect concept. There's a chance you will blow up on reentry. But sometimes it's worth trying.

Hyperspace. And reenter in the weatherbeaten barracks office of Major Dave Robinson, a trim armored cavalry officer who, as he gets up from his desk, looks as if he might shoot right through his own flat-cut hair. Until recently, he says, the only video game he can recall playing was an early tank game, years ago in a bar. At the moment, Major Robinson is assigned to the Army Training Support Center at Fort Eustis, Virginia, a field office of TRADOC, the Army's Training and Doctrine Command, and his mission is to explore the effectiveness of a modified Atari arcade game in gunnery instruction.

In the arcades, they're all volunteers

Major Robinson's orders came down from the commander of TRADOC, General Donn Starry, who was struck by what he saw in the video game arcades. "I see a lot of people in those arcades learning something," Robinson recalls the general's words, "and they're all volunteers, and they're paying a quarter to learn whatever it is they learn from these machines. I don't know what they learn, but I'm convinced they learn something, and that the Army needs to exploit it." An Army study group selected the Atari game Battlezone as a candidate for training use, and Major

Robinson led a small squad to the Silicon Valley to get the game converted, and bring it back. "In the arcade version, it's sort of a space tank war with moving pylons and flying saucers," the major explains. "We used the new Infantry Fighting Vehicle as the game."

The Army's version has realistic silhouettes of both enemy and friendly tanks, helicopters and armored personnel carriers. Using realistic aiming coordinates, a player has to pick the right weapon for a target, select the right ammunition and rate of fire, estimate the range, and destroy the target before it gets him, in anywhere from ten to 25 seconds.

"We've got the scoring algorithm designed to reward him for getting hits rapidly, and for destroying the most dangerous target first, and it subtracts points from his score if he fires at a friendly vehicle," Major Robinson says. "When we demonstrated the game at an armor conference at Fort Knox this spring, one of the generals who saw it said we should have a fist come out and punch the guy in the head if he's stupid enough to fire at a friendly vehicle."

Like arcade games, Army Battlezone gets more difficult as a player improves. "That seems to be the psychology behind Atari," the Major muses. "You never can win, and you always can get better." The Army has not yet tested the game, but has laid out a careful program of research in the field, to establish whether skills acquired playing the game can be transferred to military training. If they can, the Army already has its eyes on other games which might be modified to train air defense missile gunners and tank crews. "I am not a programmer or design technician," Robinson says. "I'm an armored cavalry officer and damned proud of it. But I've got a gut feeling that you can take these machines and put them in every company-sized unit in the army and get a lot of training value out of it."

Predecessor to Pong, Computer Space was Bushnell's original video game (1972). He sold only 2,000.

Training in many-channeled thinking

At Williams Air Force Base near Phoenix, where psychologists have had a chance to study pilots trained in the multimillion-dollar computer simulator for the newest fighters in the Air Force inventory, the A10 and the F16, arcade games are also viewed as potentially valuable.

Dr. Thomas Longridge, at the Human Resources Laboratory on the base, is using an aircraft carrier landing game for research on pilot judgment. He sees the array of information that players of some arcade games cope with as requiring skills like the rapid information processing performed by fighter pilots with video displays in their cockpits. And he thinks the games, like simulators, may train people in a kind of "multiplex," many-channeled thinking that Air Force psychologists would like to understand better. "We're interested in microprocessor-based part-task trainers," says Dr. Longridge, "as an alternative to the multimillion-dollar monster full-mission simulators the Air Force is buying now, and the extent to which you can accomplish similar kinds of training."

The distinction between computer games and computer simulators is blurring here, and in many other places where small, inexpensive microcomputers are taking over tasks that required huge mainframe computers a few years ago. Home computers have more versatility than most people know what to do with. One Atari engineer calls them "solutions in search of a problem." Already, however, they have begun to make the distinction between playing and learning a little hard to draw. An example of this is a home computer game that simulates the political economy of an ancient kingdom:

You have a ten-year reign as the king and you have so much grain, so many people and so much land. You can buy or sell land for grain but you can't plant more acres than you have people to work at farming them. If you don't feed your people enough, they start to die. If they die, you can't plant as much grain anymore, and you may get into a downward spiral. But if you plant too much and store it, rats eat some of it, and

Young computer buff Philip Yeung made geometric galaxy by writing a program in a language called Logo.

In his office, Steve Jobs confers with product manager. His "secretary," an Apple computer, is at his right.

people start coming from other villages to join you. Simulations like this first appeared on the university computers of the Sixties, along with games like Spacewar. Now kids are playing them at home.

Even more imaginative and powerful kinds of simulations are becoming available. A physicist who is working with Atari developing holography for a home game—combining the laser optics of holograms, those three-dimensional images of pure light, with the smart electronics of the computer chip—mentions an idea he thought was pure fantasy.

"I think you could teach special relativity with video games," he told me. "You can build any set of physical laws into that universe, and you can alter the parameters so that they are more apparent than they are in normal life; so on the screen you make the speed of light be ten miles an hour, put in some gravity, make it a game, and kids will start learning special relativity, the same way they learn to calculate parabolas without knowing what a parabola is, or what calculating is, in order to catch a baseball. Now that is really going to open up new vistas. It's hard to imagine. Right now people are so full of misconceptions that in designing something like a cyclotron it can be tricky to find people who have enough feel for relativity to design a machine that will work."

I didn't know it then, but that game already exists. In the Artificial Intelligence Laboratory at MIT, Seymour Papert developed an orbital game of just this sort where the player controls an object on a screen that obeys the laws of physics in space. The results were dramatic. "We worked with all sorts of people

In Logo workshop, youngsters learn to use language to turn math and logic concepts into house designs.

with no training in physics, but also people who have taken courses in physics. What we found reflects the problem with designing cyclotrons: it's easy to find people who know the equations, but it's harder to find people who have incorporated that knowledge into their intuition of the world.

"For me," Papert adds, "it's clear with students, even at MIT where they're pre-selected for being 'good at' science and math. The fact that they've done a year or two of undergraduate physics doesn't mean they've taken it into their intuition. They know the equations, but when you put them into situations where they've got to act rather than use equations, it's not just that they fall back on Newton, but they fall back on Aristotle."

The computer language called Logo that Papert developed and used to create this game was marketed this summer by Texas Instruments for use on its home computers. Papert is now advising Logo Computer Systems, a new company which is developing versions of the language for other home computers and for use in schools. Similarly powerful simulations, using a computer language called Smalltalk, have been developed at the Xerox Palo Alto Research Center, where children have been animating Saturday morning cartoons instead of watching them, designing music and playing with electronic paint brushes. Alan Kay, who directed this research, predicts that home computers that allow kids to do this sort of thing will be on the market, at no higher cost than the current ones, within this decade. And they will be no larger than a school notebook.

Such predictions have been made before and failed to materialize, but it is clear that the microcomputer has got out of the arcade. "The friendly computer is not something that's going to happen," Isaac Asimov points out, "it *is* happening. It's all around us, the games, appliances, the word-processor instead of the typewriter. It's the new age, and it is here."

If the new age is anywhere, it may be in the spare, modern office of Steven Jobs, who with his partner Stephen Wozniak invented the Apple computer. On the wall is a sort of computer sampler, the word "THINK" generated in colors of the electronic spectrum. There's an Apple computer beside his desk. The office is in striking contrast to the slicker aura that surrounds it, with a steady coming and going of Silicon Valley executives and sales reps in brass-buttoned blazers, carrying brass-bound briefcases, their faces chiseled out of the sun. Steve Jobs kicks his leather sandals off. He wears faded jeans and a western corduroy shirt with sleeves rolled up.

Steve and his partner "Woz" may be remembered as the two college dropouts who brought the computer down to earth. "Most people's view of it is still 1984-ish," he says, "and yet the way it's really happening is closer to whole-wheat bread! Instead of leading to centralized intelligence, centralized decision-making and personal unenrichment, it's started happening on a personal scale." If the computer is becoming decentralized, cheap and more accessible to the individual, Steve and Woz had a lot to do with all that.

Making the computer adapt to people

Five years ago they decided to make their own computer because they couldn't afford to buy one. "I was working at Atari at the time and Woz worked at Hewlett-Packard designing calculators," Steve recalls, "and we both liberated some parts and built our first computer in the garage of my house. Actually, we started working in a bedroom, but my parents kicked us out to the garage."

The Apple was not the first personal computer, but it was the first popular one because it hooked up to a TV set, something Steve learned from Atari, an idea implicit in Nolan Bushnell's original inspiration. Steve sees the concept of games taking on new meaning as the computer evolves to meet us on our terms. "The challenge," he says, "is to spend more of the intelligence in the box to make the computer adapt to the way people do things rather than what we do now, which is to force people to adapt to the way computers do things." The sort of change Steve Jobs has in mind can already be seen at places like MIT, where an office-of-the-future project includes a computer you can communicate with by touching its screen, or talking to

it in plain English, or even simply by pointing at it with your finger and directing it to move an image from one part of the screen to another.

It may be a while before you can wag your finger at a personal computer and get an intelligent response. But it seems certain that these machines will continue to surprise us. Dr. Robert E. Kahn, at the Defense Department's Advanced Research Projects Agency, is convinced that we're going to see "some very powerful and intelligent systems show up" in the next few years. Kahn has watched the evolution of computers from a unique vantage point, at an agency which has funded many of the most important research projects in artificial intelligence, time sharing, computer graphics, computer networks and other major advances in computer technology.

"In the next decade, we'll see a lot of what I call garage-shop computer engineering, and maybe even a little science," he says. "It's getting to the point now where you can go to your local supermarket and if you can't buy a floppy disc now, then tomorrow you'll be able to, and for $19.95 you can get a bag of logic, and some powerful chips. I think we're going to see a world of innovation come out of young kids, high school kids and pre-teens of all kinds, who are just given access to technology, with creative minds and no constraints. And talk about cultural effect—I think people may be incredibly surprised at how clever some of these young people can be. While they may not have a good basic knowledge of the outside world, they will be dealing with an artificial technology where they can construct anything that they can imagine. And they've got great imaginations."

After watching kids at MIT's Artificial Intelligence Lab, Seymour Papert has a similar view. "I don't think there's anything wrong with arcade games," he says, "except that you have to play *that* one. I think in terms of creating a computation environment in which you not only have access to unlimited numbers of games but where you can make them yourself. And then the word 'game' takes on a different meaning. I think what it is all about is getting into 'microworlds,' simulated environments which are exciting because you can manipulate them. I think we don't fully understand what makes that sort of manipulation so powerfully attractive."

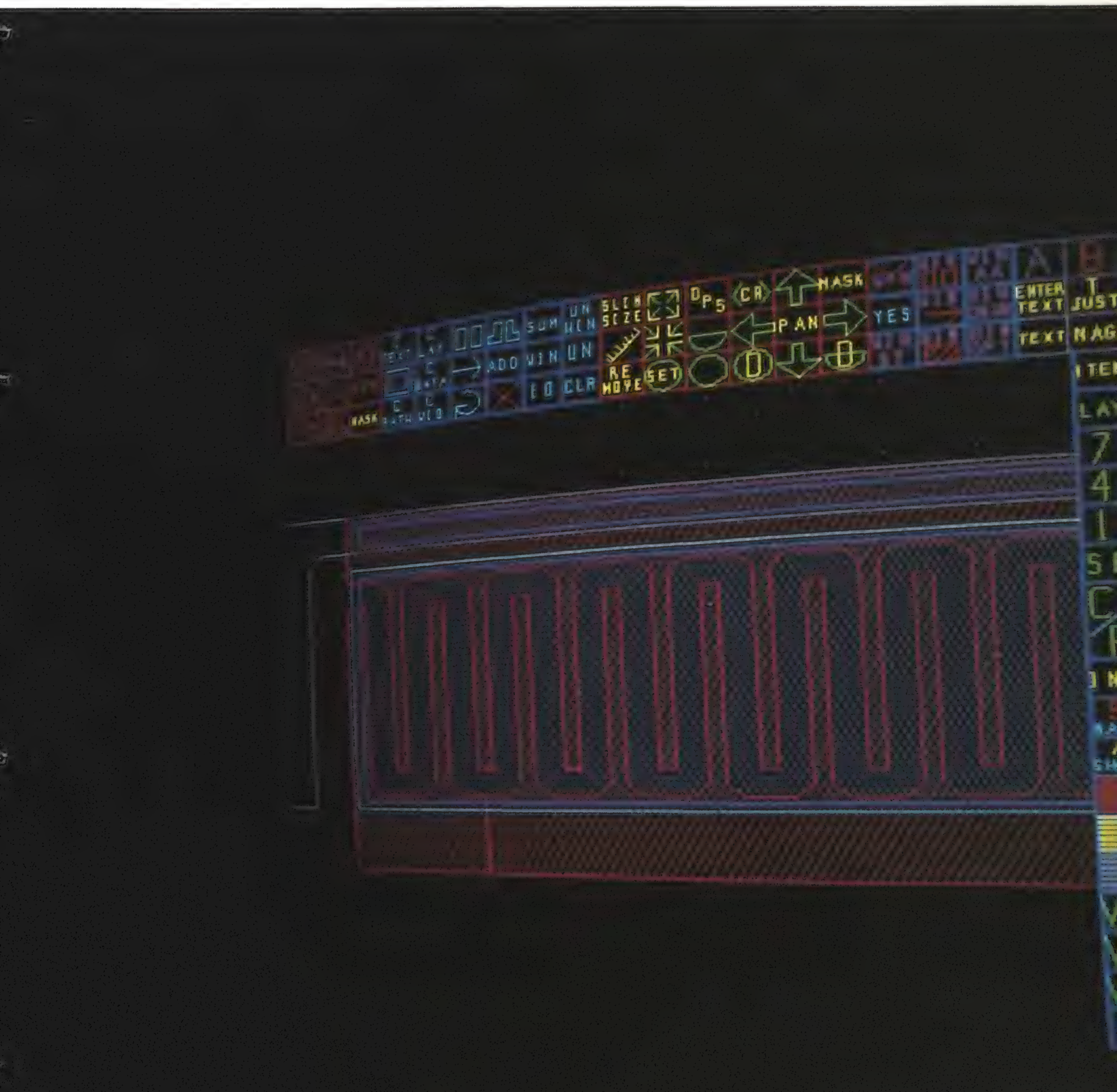
Are the Atarians in their cells really the monks of these microworlds? Not long before he built the first Apple computer, while he still worked at Atari, Steve Jobs went to India. Having grown up in the Silicon Valley, he says, he was amazed to find that Western rational thought is not an innate human characteristic. When he came back, he says, he couldn't help observing that the best computer people he knows "are probably the closest thing I have met in America to Zen monks.

"The computer," he says "is one of the pinnacles of Western rational thought. Semiconductors bring together physics, electronics, chemistry and mathematics

The line between game and science blurs in Atari lab where designer "plays" with circuits for new chip.

all into one thing. But computers bring together all that, plus they bring logic into it, and philosophy, information theory, all that. So to me, anyway, the computer represents the culmination of all Western rational thought into an artifact.

"And the people working on these computers possess a passion about the discovery and creation of something. It's not even the creation—they *know* it's there, and it's sort of what Michelangelo expressed when he was sculpting: he would look at a big rock and say, 'My statue is inside there and I just have to get it out.' It's a passion that I have only seen matched in people pursuing what they consider to be the truth of their existence. It's the same purity of spirit I have experienced in monks. These people feel that it is going to be the one most incredible revolution in our lifetimes. It's going to dwarf everything else. We are on the cliff."



It was, of course, a favorite Florenz Ziegfeld set designer, Willy Pogany, who was chosen to decorate ceiling of the game room in the house that John built. Featured in costume are John and wife, Mable.

By Robert Wernick

The Greatest Show on Earth didn't compare to home

John Ringling ran the world's most famous circus, and when he built a house and museum, he made them into a three-ring extravaganza

A bronze version of Michelangelo's *David* commands ordered parterres and colonnades of the sculpture garden courtyard, 350 feet long, of The John and Mable Ringling Museum of Art.

John Ringling, the Circus King—some six-foot-four in his silk stockings, 270 pounds, an estimated $200 million in capital assets—was a formidable figure to encounter at any time; seldom more so than on the day in the early 1920s when he summoned an architect to his office and announced that Mable wanted them to build a house.

It was to be a house worthy of a man who was the youngest, and last survivor, of the five Ringling brothers who had built one of the greatest circuses of their time, which they called, with pardonable pride, the "Greatest Show on Earth." The house would be called Ca' d'Zan, Venetian dialect for the "house of John." It would rise from the shores of Florida's Sarasota Bay, beginning with a grand marble staircase with a large boat dock where Mable could board her gondola, and rise to a tower that would dominate the palm-flecked coast. It would have 30 lofty and luxurious rooms—banquet room, ballroom, game room—and its various facades were to contain features of two of the build-

Photographs by Marvin E. Newman

The house and museum that John built

Banyan trees provide a congenial setting on museum grounds for bronze sculpture of a drunken faun.

One of pair of cast-lead sphinx-inspired sculptures which flank walk leading to Ringling residence.

ings John and Mable Ringling most admired: the Doge's Palace in Venice and Madison Square Garden in New York City.

This was not quite as bizarre as it might sound to those who know only the present Garden, squatting almost featureless on Seventh Avenue. Ringling was thinking of the old Garden he knew and loved, with its Stanford White-designed tower rising floridly above the great space where Ringling's clowns and elephants cavorted each year.

Architect Dwight James Baum produced the final set of plans. They weren't quite the combination the Ringlings had asked for, but were impressive enough to make Ca' d'Zan a great landmark on the Florida coast, a monument to the higher hedonism of the 1920s. Its rosy cream stucco walls, decorated with glazed terra-cotta medallions in soft red, yellow, green, blue and ivory, glow in the mauve sunsets.

About a half-million visitors a year stream through John's house today, admiring its spacious extravagant elegance. Here, Ringling would seldom rise before about 2 P.M., when his butler reportedly would convey a bottle of Scotch and a bottle of Apollinaris water

In courtyard is marble and bronze copy of tortoise fountain which stands in Rome's Piazza Mattei.

to his bedside. He would then venture off to the breakfast room to start a meal, it has been said, with a first course of five grapefruits and a plateful of mangoes or 12 oranges. By nightfall he would be ready to turn his attention to work or to play, either one of which he would pursue until dawn with the untiring zeal he had inherited from his father, an immigrant German harness maker.

Other night owls flocked to his parties, most of them self-made men of his own stamp and generation: John J. Raskob the industrialist, W. J. Burns the detective, Mayor James (Jimmy) Walker, Governor Alfred E. (Al) Smith and Florenz Ziegfeld the showman. Like today's tourists, they would pause to gape at the various showpieces of the mansion. There were (and are) Venetian glass windows; a crystal chandelier from the old Waldorf-Astoria Hotel in New York; a 4,000-pipe Aeolian organ; a 19th-century delftware birdcage for Mable's cockatoo Laura; an ornate ceiling of Florida pecky cypress over the central court; a massive brass-railed bar from John's favorite restaurant in St. Louis; a bathtub cut out of a solid block of Siena marble in John's bathroom; two massive mahogany Second Empire double beds in his bedroom (Why two? It was just that John liked to think big); an inlaid sandalwood and ormolu Louis XV double bed in Mable's bedroom; the dining room, deliberately designed in dark muted tones so that the guests' jewels might sparkle brighter around the black walnut table; the bank vault upstairs for all the bootleg liquor.

The ceiling of the game room on the third floor is covered with high-spirited paintings by Hungarian artist Willy Pogany, a set designer for Florenz Ziegfeld. John and Mable can be seen in one section, in Venetian carnival costumes, dancing (p. 62). There are formal portraits of them downstairs, rather pallid ones by comparison, by a society painter of the day. "John, it's a good likeness," Will Rogers is quoted as saying to Ringling at one of the many parties held at Ca' d'Zan, "but it isn't much like you . . . you've got your hand in your own pocket this time."

Ca' d'Zan occupied only a small fraction of John Ringling's land holdings in Sarasota. Since he first came, in about 1910, to that drowsy little fishing village, he had been buying up real estate, and at one time owned about 25 percent of its total area. He increased its value substantially by moving the winter quarters of the circus to Sarasota. He also had the idea of building a luxury hotel on one of the keys offshore. Not any old luxury hotel: it was to be a Ritz. On his winter trips to Europe to book new acts for the circus, he began collecting truckloads, shiploads, of old stone columns, bronze fountains, antique and Renaissance statuary, barrel tiles from the roofs of demolished buildings. An art dealer from Munich named Julius Böhler traveled with him, giving him advice on where, say, in Naples to get a fine bronze copy of Michelangelo's *David.* Böhler also steered the conversation

Marble original of this early Roman votive chariot is in Vatican Museum. This is a modern bronze cast.

toward paintings, a subject which had interested Ringling since his long bibulous conversations with Stanford White and Augustus Saint-Gaudens at the Garden in the early days of the century. Ringling took the hook—he instructed Böhler to buy two Renaissance masterpieces that had just become available, a Luini and a Veronese—and, in time, a good deal more. He announced to Böhler that he was going to construct at Sarasota a great cultural monument which would be his legacy to the people of Florida, and that he intended to stock it with the greatest paintings he could lay his hands on.

He threw himself into this enterprise with the same thoroughness and vigor that marked his planning of circus itineraries. He eventually dropped the Ritz project and decided to use the mountains of stone and bronze he had been collecting for the museum instead. He hired architect John H. Phillips to create a huge pink stucco palazzo about a quarter of a mile from where Ca' d'Zan stood. Three wings arose around a huge central court with loggias lined with 92 columns from dozens of palaces and monasteries in Europe, almost all of different forms, styles and heights, but surprisingly well matched. It was a big building, meant to hold big pictures; the walls of the galleries were more than 18 feet high.

John Ringling knew little enough about art when he began to acquire works for these galleries, but he was a voracious learner, sure of his own taste, and in only about five years he put together one of the most remarkable collections in the United States.

He acquired dozens of old masters for rather trifling sums. He was perfectly willing, too, to pay out much bigger ones if he had to. When he heard, in 1926, that four Rubens cartoons (full-scale studies) for the tapestry series *The Triumph of the Eucharist*, from the estate of the Duke of Westminster, had gone unsold in 1924 at an auction at Christie's, he swooped down and bought them all for £20,000, a most respectable price for the time, if ridiculous by today's standards.

The reason no one else would buy them was, for one thing, their huge size—they measure up to 14 by 19 feet—and no one knew where to hang them. Moreover, though Rubens might be grudgingly admired, the whole artistic movement of which he was the brightest light, the Baroque, was in bad repute among the cognoscenti at that time.

Ringling, however, liked Rubens, an artist with whom he must have felt he had much in common. They both apparently savored rich banquets and pretty women. They thoroughly enjoyed living like princes. They shared a taste for sweep and grandeur and for wild animals. If Rubens had lived in the 20th century, might he not have been happy to design circus wagons for the Greatest Show on Earth?

The Triumph of the Eucharist was one of Rubens' most ambitious and most complex works. It was ordered by the Archduchess Isabella, Governess of the Netherlands, who also employed the painter as her own sort of Henry Kissinger on journeys to shore up the crumbling peace of Europe. Cartoons are designs or studies to be transferred or copied, as in the making of tapestries. Ordinarily they were painted on paper, but for this important commission Rubens used oil on canvas. The cartoons were once thought to be jour-

At dusk, a lowering tropical sun adds pure gold to handmade Venetian glass windows of west facade

Robert Wernick, a frequent contributor to SMITHSONIAN, *wrote on the magical boxes of Joseph Cornell in the January 1981 issue.*

of Ca' d'Zan. Building was inspired by the Doge's Palace, Venice; tower, by old Madison Square Garden.

neyman work by the apprentices in Rubens' studio after the master's designs, but thorough cleaning and close inspection have indicated to some art historians that Rubens must have worked personally on these canvases to a great extent.

Such a belated confirmation of Ringling's judgment is not rare, but unlike other American millionaire collectors of his time, the Morgans and the Mellons, for example, he did not depend so heavily on the advice of selected scholars and dealers. Even though he kept Böhler at his side, he bought only what he liked. He could make mistakes like everybody else, and paintings in the museum once ascribed to Titian or Tintoretto are now modestly marked down to pupils or copyists. But many more of Ringling's choices have been upgraded. A portrait which he bought as the work of a minor figure named Romanino is now recognized as an early first-rate Veronese. He paid the equivalent of $56 at a London auction for a dazzling Annunciation, which only he recognized as an authentic Guercino.

Some of Ringling's choices might have been suggested to him by his own life. A country boy born in McGregor, Iowa, and raised primarily in Baraboo, Wisconsin, in country that still smacked of the frontier, could not help having an empathetic feeling toward the painting by Rosa Bonheur, whose reputation stood near absolute zero in the first half of the 20th

century, of a span of oxen straining to turn up the stubborn soil—a painting that used to hang in the breakfast room at John's house. The *Still Life with Parrots* by the 17th-century Dutchman Jan Davidsz. de Heem, with its scintillating cascade of lobster claws, oysters, ripe fruit and bird feathers, must have struck a sympathetic chord in the heart of a gargantuan eater who used to hold breakfast conversations in German with his parrot Jacob. Piero di Cosimo's painting *The Building of a Palace* must have recalled to Ringling his own great monument rising in Sarasota. Some of the 15th-century pulleys and other devices in the painting were quite similar to the ones his own circus roustabouts used when they helped to hoist up the statues that now stand all around the roof of the museum's loggia. Indeed, John Ringling's sense of showmanship runs through the whole museum.

Ringling's interests were far-reaching, and though his heart remained in 17th-century Italy, he took an interest in art of all periods—all periods except, of course, his own. American millionaires simply did not collect contemporary art in the 1920s.

Collecting, building and gardening

While John was absorbed in building and stocking their art museum, Mable was hardly idle. She went on collecting fans and lace and cockatoos and was an active partner in their vast building project. She determined to turn the great space between their house and their museum into a kind of museum of its own—one of landscape architecture. In high boots and with a pistol at her hip to handle the rattlesnakes, copperheads and alligators that shared the land with her, she plunged into the mangrove swamps to supervise their transformation into gardens—formal Italian gardens with their punctuation of cypresses and statues; a multicolored rose garden; lush subtropical gardens—a manicured jungle of banyan trees, monkey puzzle trees, bunya bunya trees, grugru palms—some 200 different varieties of exotic growths.

She never lived to see the work completely finished. She died in 1929, a few months before the stock market crash. The two blows were enough to cripple even big John Ringling.

Up to then, his had been an almost legendary life. The sixth son of a German immigrant, he had teamed up with four of his brothers to start a touring circus out of Baraboo, Wisconsin, which through more than 20 adventurous years grew and grew until it had absorbed its rivals and went unchallenged when it advertised itself as the "Greatest Show on Earth." John was the advance man, the planner. As his brothers died off, he became sole and undisputed Circus King. He piled fortune on fortune—oil wells in Oklahoma,

Spacious gallery was custom-built to house four huge Rubens cartoons for tapestry series entitled

"Five Graces" Bandwagon is part of the display at the Ringling Museum of the Circus, built in 1948.

The Triumph of the Eucharist. Ringling bought the full-scale studies from Duke of Westminster's estate.

The Asolo Theater, built in 18th-century Italy, was transported in pieces to the Ringling complex.

an immense ranch in Montana, real estate in Florida, numerous subsidiary holdings including two theaters in Baraboo. He was fortunate in his private life too. He found his million-dollar baby, not precisely in a five-and-ten, but, the story goes, behind the cashier's desk of a Chicago restaurant. She was a farm girl from Ohio who learned how to grow rich graciously. She was a faithful, fun-loving companion, who was happy traveling with him, dancing with him, living the princely life with him at their several homes (Ca' d'Zan was home just for two or three months in the winter), and in their private railway car and the staterooms of liners and the luxury hotels of Europe.

There was plenty left over

When she died, something went out of his spirit. And the Depression tried him mightily. He was overextended, land-poor, and he had to rein in his raging ambitions. Sarasota folk sometimes tend to exaggerate the misery into which he plunged. They like to recall that he used to scoop up the coins left as parking fees at the museum so that he could buy gas for his fleet of Rolls-Royces and Pierce-Arrows in the evening. They say that when he died he had only $311 in the bank. This, however, as his former accountant points out, was only his personal account in the Sarasota bank. He had plenty left over, squirreled away in different parts of the country to escape the prying eyes of the Internal Revenue Service and the lawyers of the lady with whom he had been briefly linked in a disastrous second marriage. His estate seemed to have no trouble coughing up some $850,000 to settle liens for back taxes, going as far back as 1913, the year the income-tax amendment was passed.

Still, the great days were over. Ringling's last purchase of art was in 1931, some five years after he had started, just as he was becoming confident of his expertise and ready to start weeding out the inferior pieces he had acquired along the way. His last years seemed tragic, his great body a crippled hulk, his beloved circus finagled out of his control, lawyers yapping at his heels. When he died in 1936, his estate was in such a mess that it took ten years to straighten it out. However, his main wish came true, and the great tract with his home and his museum and the gardens came into the possession of the state of Florida.

With the help of some enlightened governors and some dynamic directors, the state has managed to avoid most of the drawbacks of bureaucratic management and has run the Ringling heritage with some of the Ringling flair.

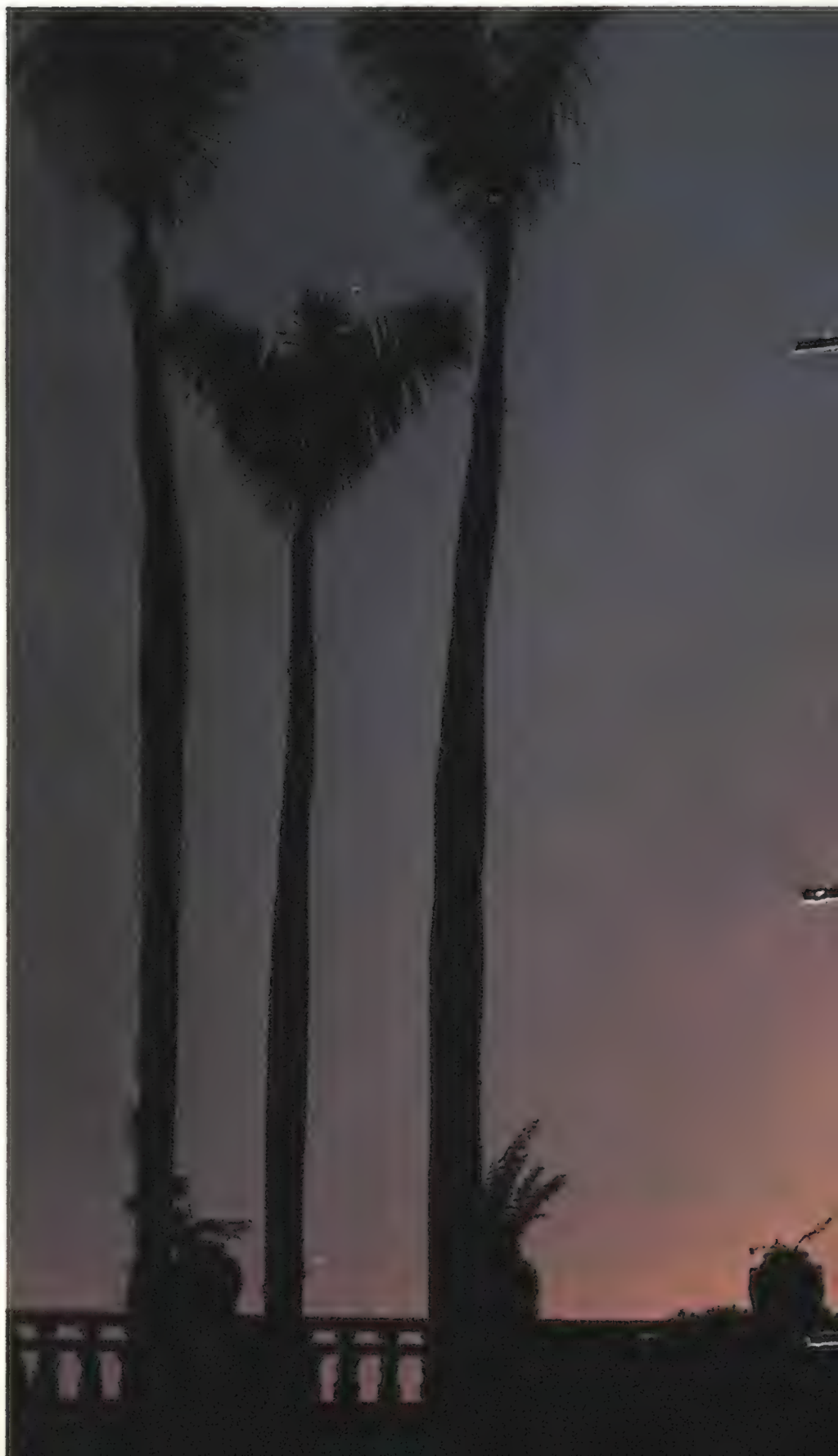
Two new buildings have been added to the complex. One of these is the Asolo Theater, a gem of 18th-century elegance, which was built in the little town of

Asolo in the hill country near Venice, in honor of Caterina Cornaro, a noblewoman who had ruled as queen of Cyprus in the latter part of the 15th century —the days of Venetian glory. It was a favorite of great singers and actors for some 150 years, until it was dismantled, piece by piece, in 1930 to make way for a movie theater. A Venetian antique dealer bought all the pieces of the interior and stored them away intact. About 20 years later, the state of Florida, at the urging of the Ringling Museum's first director, A. Everett Austin, purchased the theater and had it shipped over, reassembled and eventually permanently installed in its own building next door to one of the wings of the art museum. It is one of the loveliest theaters in existence: small (320 seats), gracefully scaled, coolly aristocratic, with the acoustical richness which modern engineers seem unable to duplicate.

The other building, erected in 1948, is a circus museum. Ringling would have enjoyed the museum, with its gaudy wagons, its posters, its memorabilia of famous freaks and acrobats and human cannonballs, and its scale replicas of life under the Big Top.

The circus had been the center of John Ringling's life since the day in 1870 when, at the age of four, he ran down to the riverside in McGregor, Iowa, where the family was then living, and saw looming out of the mist, and tootling music with all its might, a gaudily painted circus boat packed with horses, an elephant, clowns, spangles, feathers, romance. The Ringling boys got together the very next day to plan a show of their own. Admission was one cent, and they cleared $8.37 from a series of performances. In following years they put on slightly bigger shows, at first doing most of the numbers themselves—John played the alto horn and did dialect routines as "The Emperor of Dutch Comedians"—adding animals: first, an educated pig, then a hideous hyena, finally elephants and zebras and emus. It was a job for titans, driving their teams of plow horses from one one-night stand to the other, from Prairie du Chien to Sauk City through prairie blizzards and prairie mud. But they were thrifty, honest and tough, and they knew what the public wanted. By 1890 they were traveling by railroad; by 1908 they had bought out their great rival Barnum & Bailey.

Visitors to the circus museum come away with immense respect for the organizational powers of the brothers Ringling, who had to keep setting up and tak-



A setting sun drops into Sarasota Bay, dramatically silhouetting *David* and towering palms in epic view.

ing down this complex world under canvas and shiping it around the land on the tightest of schedules.

It is now more than a half-century since The John and Mable Ringling Museum of Art was opened to the public, and the 50th-anniversary season, which has just come to a close, was celebrated with due satisfaction.

It might come as a surprise to some to learn that here in Florida is one of the most imposing collections of art in the whole southeastern quarter of the United States. The local people, however, are quite aware of it, and support the Ringling with exemplary enthusiasm. Statewide public subscription in this last anniversary year, supplemented by museum moneys, created a fund with which the Ringling was able to buy a fifth Rubens cartoon from the *Eucharist* series. Theater and opera cycles at the Asolo help make Sarasota a leading cultural center in Florida. Just last year the Ringling was designated the official art museum of the State of Florida by the state legislature.

John and Mable were said to have toyed with the idea of having themselves buried in a marble crypt under the giant bronze *David* in their museum's garden. The plan never worked out. In fact, their bodies are apparently in a mausoleum somewhere in New Jersey. But John, who reportedly once told a friend to just throw his bones in the Gulf, would hardly have cared. Those pink palaces sparkling in the ultraviolet sun, all that well-ordered greenery, the proud prancing statues, the acres of passionate paintings, make all the memorial he would have wished.

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By Cassandra Tate

American dilemma of jobs, health in an Idaho town

After many years of regulatory conflicts and clean-up efforts, lead is still flying in Kellogg over the problems of pollution

Photographs by William Thompson

Patricia Martin

Kids in Kellogg have been focus of concern since 1974 study found many with high lead levels in blood.

Tall stacks of Bunker Hill Company's lead smelter (left) and zinc refinery tower above the Idaho town.

You see the smokestacks first: two improbably long fingers of concrete pushing into the northern Idaho sky. Then you notice the hills: scabby and runneled, parts of them looking as if they had been raked clean by a huge muddy hand. It's a hazy morning. The sky is a thin blue, with a faint edge of sulfur in the air. It smells as if someone has overcharged an enormous battery. A smoker complains that her cigarettes taste funny. "WELCOME TO KELLOGG," says the weathered billboard on the edge of town. "FISHING. MINERALS. JOBS."

The smokestacks jut out of a mile-long tangle of buildings housing the lead smelter, zinc and silver refineries and related industrial facilities of the Bunker Hill Company. The company produces about 20 percent of the nation's primary lead and zinc and 25 percent of the primary refined silver. In the course of this it puts thousands of tons of sulfur dioxide, lead, zinc, cadmium and other pollutants into the environment every year. It also employs about 2,100 people. Such are the outlines for an exemplary tale of our times.

Kellogg (population 3,417) is the hub of Idaho's venerable Coeur d'Alene mining district. Eight major lead or silver mines, including three owned wholly or in part by Bunker Hill, operate in the area. There have been jobs here for nearly a century. But prosperity has come at a price.

The river that runs through town—the South Fork of the Coeur d'Alene—is still one of the most polluted in Idaho. Nearby pastures are soaked with heavy metals from river overflows, mine tailings and smelter emissions, making them lethal to horses. Hills around Kellogg have been scoured raw by decades of smelter fumes. Forest fires and miners seeking timber had denuded much of the Coeur d'Alene district by the 1930s,

Bunker Hill worker offers evidence of company's efforts to clean up—a giant beaker of treated water.

but sulfur dioxide from the smelter has delayed revegetation; land outside a five-mile radius of the smelter now has dense, second-growth timber.

Furthermore, seven years ago, the U.S. Public Health Service's Center for Disease Control (CDC) discovered that most of the children of Kellogg and surrounding communities had abnormal amounts of lead in their blood. Air-pollution monitors in a trailer at the Silver King Elementary School, in a gulch just below the smelter, were recording levels of airborne lead that were among the highest ever found in the United States. The amount of lead in both the air and the children has decreased since then. But the federal air lead standard is still regularly exceeded by a factor of ten at the Silver King School, and a survey last year showed there is still too much lead—by federal standards—in the blood of more than half the children living within a mile of the smelter.

Almost anybody in town will tell you that things are better than they used to be. Pam Nichols, an amiable florist who's spent most of her 33 years here, remembers that when she was a child her blond hair would sometimes turn green because of all the sulfur in the air. Others recall that, for days on end, there would be blue skies and sunshine on the hills above town and haze so thick in Kellogg you had to drive with your lights on. The South Fork was as white as lye with industrial and municipal wastes. "Lead Creek," it was called, and children were warned to stay away from it. Dogs that drank out of puddles after a rain sometimes died. You couldn't keep a lawn or raise a garden. "I figure I grew up here when the smelter smoke was a lot worse than it is now, and I'm OK," says Nichols. "I think this business about the kids being leaded has been blown way out of proportion. In any area where you're going to have bread and butter on the table, you're going to have some problems. There are pros and cons for living in the valley, but there is work here."

"We never saw blue sky . . . or the sun"

There could hardly be a worse spot for a smelter. Kellogg is hunkered into a narrow, steep-sided valley, with an average of 200 days of pollution-trapping temperature inversions a year. A smelter is a potent neighbor in such a setting. Within a few years after it was fired up in 1917, its breath had shrouded the community to the point that the company built an ultraviolet "solarium" to provide workers and children with regular doses of substitute "sunlight."

"We never saw blue sky when I was there in the 1930s," a former resident recalled a few years ago. "We never saw the sun. Right after we moved there, I put my baby daughter on the porch one morning. A neigh-

bor came running over and said, 'Don't you know any better? You can't put a new baby out on the porch in the morning! It's real bad of a morning here!' I remember another night my daughter had been very ill; we didn't know what it was. She was just gasping for breath. The next morning, the clothing that had been hanging on the clothesline all night went to pieces as I got ready to iron it. We wore rayon in those days. It was the sulfur dioxide that had destroyed the fibers."

A combination of litigation (beginning in the early 1900s), legislation, and the development of methods that made it profitable to recover sulfur dioxide resulted in dramatic improvement by the 1970s. The river was no longer being used as a convenient sewer for mining, smelting and municipal wastes. Bunker Hill had completed an effluent treatment plant for its facilities. It was undertaking an ambitious program to revegetate 18,000 acres of wounded hillsides, using seedlings grown in an underground greenhouse (right). It was making phosphate fertilizer with sulfur dioxide that once had spurted freely into the air. Lawns and gardens had begun to flourish. Trees and brush were returning to some of the hills. Only the old-timers remembered the solarium, closed in the 1940s.

But meanwhile, emissions of lead from the main smelter smokestack were increasing, from monthly averages of 8.3 metric tons during 1955-64, to 11.7 metric tons from 1965 through September of 1973, to 35.3 metric tons after October of 1973—when the baghouse, the main dust-control device at the smelter, was heavily damaged by fire. The smelter continued to operate despite the damage. That same month, a three-year-old Kellogg girl and her two-year-old brother were taken to a local doctor for treatment of abdominal pains. Their mother said they had played in some "soot" uncovered during a remodeling project in their home. Tests showed their lead levels were higher than normal, but not alarming. Four months later, still complaining of abdominal pain, they were taken to a pediatrician in Coeur d'Alene, 30 miles west of Kellogg. Their lead levels had risen. In April 1974, the children were hospitalized for lead poisoning, and state health officials were notified. These were the "index cases," in the argot of the epidemiologists: two pebbles tossed into a pond, with ever-widening consequences.

Dr. Philip J. Landrigan, then the Chief of Environmental Hazards Activity, Cancer and Birth Defects Division, Bureau of Epidemiology at the Center for Disease Control in Atlanta, Georgia, had accumulated a sizable file on lead by the time he heard about the two children. He had recently directed a CDC study that found unhealthy lead levels in about half the children living near a smelter at El Paso, Texas. Neighborhoods closest to the smelter were evacuated and additional pollution controls installed as a result.

Seedlings for "The Bunker's" reforestation program thrive in greenhouse located 3,000 feet underground.

Landrigan took a phalanx of public health specialists into Kellogg for a two-week, door-to-door survey in August 1974. Blood was collected from 1,047 children under age nine, along with samples of yard dirt, vegetation, house dust, paint and pottery from their homes. Analysis showed that 98 percent of the children living within a mile of the smelter had potentially dangerous amounts of lead in their blood (more than 40 micrograms of lead per 100 milliliters of blood). Twenty-two percent—a total of 44 children—had levels high enough to be defined as lead poisoning (more than 80 micrograms). More than three-fourths of those living between a mile and two-and-a-half miles of the smelter had levels above 40 micrograms. The levels decreased with distance from the smelter. The average amount of lead in the children was twice as high as that found in El Paso. Concentrations in some of the environmental samples were higher than any recorded in the scientific literature.

Lead is one of the oldest, most ubiquitous, most toxic and most studied substances used by man. Pliny the Elder, in the first century A.D., warned against the toxic effects of lead fumes. Lead can damage the nervous system, including the brain, the blood-forming system, the kidneys and the reproductive organs. At sufficiently high levels, it causes convulsions, coma and death. The effects of lead begin at low levels, so that

A Seattle-based free-lance writer who specializes in environmental affairs, the author wrote on the Tennessee Valley Authority in January 1980.

Eerie underworld of the Bunker Hill miner is 131 miles of the lode's tunnels, crosscuts and drifts.

although there are no observable symptoms, damage may well be done, and it may well be irreversible.

CDC researchers at Kellogg concluded that children with lead levels above 40 had sustained minor nerve damage and mild anemia. A study paid for by Bunker Hill found no evidence of any injury.

In 1979, Dr. Herbert L. Needleman and a research team at the Children's Hospital Medical Center in Boston—in a major study involving 2,335 first- and second-graders—reported that the higher the concentration of lead in the children's teeth, the lower their scores on intelligence and functional tests, and the lower their teachers rated their classroom performance. Needleman concluded that lead can have harmful effects at levels previously considered safe. Partly as a result of his work, the Public Health Service has lowered its acceptable limit on lead from 40 micrograms to 30.

"Lead is nasty stuff," says Landrigan, a lean, neatly bearded man of 39, now director of epidemiology at the National Institute for Occupational Safety and Health in Cincinnati, Ohio. "It's particularly dangerous for young children, because their nervous systems are still undergoing development and are very vulnerable to the damage that lead can produce. It's also subtle stuff. It doesn't produce gross malformations. It produces mild to moderate dysfunction—mild learning disability, moderate psychologic alteration—such that a child is less able than his peers to function, less able to compete."

"I don't like people poking at my kids"

"There's nothing wrong with my kids," says Kathy Kriedeman, flatly. Kriedeman and her husband, Lowell, and their two children live in a small, tidy house on the main street of Smelterville—a community with a post office, two taverns, about 840 citizens, and some of the highest concentrations of lead found in the Kellogg area. Her children, now aged nine and 13, both had lead levels higher than 70 micrograms when tested during the CDC survey. Kriedeman—a large, sturdy woman in her early 30s, with mild blue eyes—has refused to have them participate in any of the numerous follow-up surveys since then. She has declined several offers to have them tested for neurologic or psychologic abnormalities. "I don't see any need for it," she says. "I don't like all these people poking at my kids, sticking their noses in where they don't belong." She pauses. "I don't know. Maybe there is more wrong than I realize, but I don't think so."

The family moved to the area in 1967 from North Dakota, because Lowell had heard there were jobs here, at good money. He works in Bunker Hill's zinc refinery. Kathy stayed home until her children were out of the toddler stage. Then she too went to work for "The Bunker," getting a job in the smelter.

The smelter had not hired women—except for a brief period during World War II—until the early 1970s, when it was opened up in response to pressure from the Equal Employment Opportunity Commission. Kriedeman was one of the first to be hired. The Occupational Safety and Health Administration (OSHA), the federal agency that sets and enforces standards for workplace health and safety, has measured lead levels up to 7.37 milligrams—7,370 micrograms—per cubic meter of air in areas of the smelter. (The current OSHA standard for lead in occupational environments is a maximum average of 50 micrograms per cubic meter of air over eight hours.)

Respirators were available to smelter employees at the time, but their use was not strictly enforced. Kriedeman rarely wore hers. "They're too hard to breathe through, especially when you're working." Ten months after beginning her job, she discovered she was pregnant. She asked for a transfer. "There was all that smoke coming directly up in my face. I was getting sick from it." But, she says, her request was denied, so she quit her job. A week later, she miscarried. She says her doctor, since deceased, told her that the miscarriage probably occurred because she had been working in the smelter.

Kriedeman returned to work several months later. She worked until April 1975, when Bunker Hill announced that women capable of bearing children would no longer be employed in the smelter, because of "medical information which indicated lead might cause fetal complications." This meant that a woman of child-bearing capability would have to undergo sterilization in order to be eligible to work in the smelter. The 29 women then at work were transferred to other jobs. Eighteen of them, including Kriedeman, promptly filed charges of sex discrimination, to which an exasperated James H. Halley, Bunker Hill's president at the time, responded:

"So am I supposed to put those women in the plant, or am I supposed to keep them out of the plant? Which is the most moral thing to do? If we don't put women in the smelter, that's going to mean fewer jobs for women. If we put a woman in the smelter, and she gets pregnant, we're liable to have a mentally retarded person born who otherwise would have been normal."

Only sterile women work in the smelter

The charges were settled out of court; the company's policy stood, and financial arrangements were made with the women individually. But OSHA has challenged Bunker Hill's policy.

About 20 women, all sterile, now work in the Bunker Hill lead smelter. Kathy Kriedeman is not one of them. She chose not to be sterilized, and she ended up with a better-paying job, testing ore samples in the company laboratory. She bears no ill will toward "The Bunker." "At the time I lost the baby, I was angry because they hadn't moved me out of there. They should have known that that kind of work would harm an unborn baby. Now, I guess it was just supposed to be. I feel Bunker's trying to make this a better place for people to live. They've done a lot to clean up around here. I feel we've got to give them credit for that."

There is widespread concern among physicians and scientists about the effect of lead on the reproductive systems of both men and women. Lead has been shown

Bunker Hill miners knock off after arduous day in one of world's largest lead-silver-zinc mines.

Tons of lead "pigs" stockpiled outside of smelter attest to current unsatisfactory market conditions.

to disrupt the ovarian cycle in women, and to produce impotence, impair libido, and decrease the number and quality of sperm in men. But although damage may be done to either sperm or egg, a unique problem presents itself once conception occurs. A fetus is particularly vulnerable to lead, and some experts believe the danger is most critical during the earliest weeks, before a pregnancy can be confirmed. In a perfect world, reproductively active men and women would stay out of smelters—and foundries and chemical plants and factories and other places where they are exposed to various toxins—before conception and during pregnancy. In the real world, other jobs aren't always available. And not all pregnancies are planned.

"So clean up!" says an indignant Eula Bingham, former head of OSHA during the Carter Administration. "Clean up the workplace! This business of having people go out and be sterilized—and I would feel the same way if it were men—to me it's like saying you're going to work on this machine and you might get your hand cut, so to prevent our liability, you'd better go out and have your hand amputated."

Eula Bingham, now back at her pre-OSHA position as a professor of environmental health at the University of Cincinnati, has a brisk manner, a steady gaze, and very firm opinions about the role of federal regulators. She points out that many of the "Mickey Mouse" regulations for which OSHA is infamous (such as those relating to the positioning of fire extinguishers and the dimensions of toilet seats) were originally drawn up by industry associations. When it was created in 1970, OSHA took the industry standards—then advisory—and made them mandatory. Bingham eliminated more than 900 of those rules shortly after she took office in 1977.

"But there still remain areas of occupational safety and health that must be regulated," she says. "It's not being nitpicky to go after lead in the workplace, or asbestos, or benzene. It's not overregulating to say that a company should not make profits that a worker has to pay for with his kidneys or his lungs or his arm."

Under her direction, OSHA adopted a lead standard that represented either a promise fulfilled or a nightmare realized, depending on your perspective. The standard was built around two requirements. First, it ordered the use of permanent engineering controls, not respirators, to meet a new exposure limit. Union officials say respirators are a health hazard, primarily because they're difficult to breathe through. Industry representatives say the greater cost of engineering controls is unreasonable, particularly for older smelters like Bunker Hill's. The second major requirement in the standard was the "worker removal provision." Workers who accumulated blood leads above certain levels would have to be transferred to other jobs or be sent home for up to 18 months—at no loss of pay, benefits, or seniority—until their levels dropped.

When it issued this standard, OSHA conceded that it would be exceedingly difficult for the nation's six primary lead smelters to comply, given their existing facilities. They would either have to make major modifications or convert to new technology.

Since 1978, the OSHA standard has been vigorously challenged in the courts by the Lead Industries Association and Bunker Hill. The U.S. Court of Appeals, District of Columbia, upheld the major provisions of the standard in August 1980. There are no further avenues of appeal by industry since the Supreme Court refused to hear the case this past June, and so as it stands now, that standard is in effect for smelters like the Bunker Hill Company's. The smelters have up to ten years to install required engineering controls to meet the 50 microgram air lead limit without requir-

At dusk, pollution hovers over the Coeur d'Alene South Fork. Placement of the lead smelter and zinc

ing workers to wear respirators. However, under its new director, Thorne G. Auchter, a former building contractor, OSHA is reviewing the standard to determine whether changes are warranted in order to ensure that it is cost effective.

When it issued the lead standard, OSHA argued that its mandate was to ensure workers maximum protection on the job; that the cost of that protection should be feasible but of secondary consideration. Auchter believes that inadequate consideration was given to costs when the standard was promulgated.

"There is no way, in a world with finite resources, that we can say cost is of absolutely no object," says Auchter. "It would be patently wrong to do that.

"We believe a review will be very valuable to see if the lead standard as it is written is the best method of addressing the question of lead in the workplace. We would first determine the proper level of exposure, which might or might not change, based on our analysis of data in the record. Then, we would use a cost-effectiveness approach to determine the best way to reach that level. We believe we can do a cost-effectiveness study and *improve* the standard. That is, provide maximum employee protection—as shown to be necessary based on the data we collect and objectively analyze—while doing it in the most cost-effective way. There's no reason anyone should want to do it at higher cost, assuming the employee protection level will remain the same. Some unions, as we talk about our approach, automatically assume the worst. I'm sorry they feel that way. I think time will tell that they were wrong."

If OSHA doesn't change its direction administratively, Auchter feels, more drastic changes will be made legislatively. He points out that more than 30 bills to abolish OSHA have been introduced in Con-

Florist Pam Nichols recalls her hair turning green from airborne sulfur when she was a child.

gress over the years. "This agency has never been the effective tool for safety and health at the workplace level that Congress envisioned it would be," he says. "We hope to be able to turn that around. And we think it's necessary to take that approach, because Congress is watching us very carefully."

The Environmental Protection Agency (EPA), which watches out for environmental conditions in the community at large, addressed the problem of lead from smelters only after being ordered to do so as a result of a lawsuit brought by the Natural Resources Defense Council (NRDC) in 1975. The ensuing EPA lead standard (1.5 micrograms per cubic meter of air) was promulgated in 1978 under the Clean Air Act. Like the OSHA standard, it has been fought in court by the Lead Industries Association and Bunker Hill, and has emerged essentially intact. However, the standard could be changed by Congress this year or next, in the upcoming Clean Air Act review.

The new administrator of EPA is Anne M. Gorsuch, a former attorney for Mountain Bell Telephone Company in Denver. She supports the view that EPA has hampered economic growth by overzealous regulation.

Bunker Hill officials decline to discuss any of these matters because of a court order—issued in response to the company's complaint of excessive negative publicity—banning public comments by all parties to a $20 million lawsuit filed against the company by two former Kellogg families. The plaintiffs claim their children suffered permanent brain damage as a result of smelter emissions in the early 1970s. The case is nearing trial. "The gag order is both a blessing and a

plant in the rugged valley adds to problem caused by an average of 200 temperature inversions a year.

Local residents Lou and Joyce Horvath believe more studies are needed to determine lead's effects.

curse," says Jack W. Kendrick, Bunker Hill president. "We can't defend ourselves, but we're not faced with a constant barrage of unfavorable publicity."

It's a deceptively simple question: how much pollution is too much? The answer was easier when rayon was still dissolving on the clotheslines in Kellogg. It gets difficult when it gets subtle. The researchers talk about such things as a possible five-point decrease in nerve conduction velocities. Company officials speak of less esoteric matters. They say they may have to close the smelter if forced to spend more money on pollution control. The smelter isn't the only source of jobs in Kellogg, but it's the major one. The townspeople can see how much improvement there's been in the environment. They know the lead industry is being affected by the slowdown in American automobile manufacturing and by the phase-out of leaded gasoline. Bunker Hill has made a good deal of profit in recent years on refined silver, but silver prices have dropped. Faced with these tangible threats to their paychecks, compared with an intangible threat to their children and themselves, people in Kellogg—not surprisingly—tend to agree with the company that their town doesn't have a pollution problem anymore.

In October 1974, Bunker Hill closed the smelter for four days to repair damage done to the baghouse (the main dust control facility) a year earlier. The amount of lead in the air dropped abruptly after that. There was further improvement in 1977, when the company built a 715-foot smokestack at the smelter and a 610-foot stack at the zinc refinery. The stacks were designed to satisfy sulfur dioxide limits, but they reduced the concentration of lead and other pollutants as well. The emissions go 500 feet higher than they went before, to be spread over a wider area but diluted in Kellogg itself. Readings on the lead monitors at the Silver King School now average less than half those of 1974, but they're still ten times higher than the EPA standard.

A referendum kept the school open

The school is the only nonindustrial building left within a half-mile of the smelter. The company bought all the houses in the area, burned them and cleared the land. In 1975 the school board announced its intention to close the school because of concern over the high lead levels, but the people in the district protested, saying there was not enough evidence the lead would harm their children. The issue was put to a vote. Of 1,127 ballots cast, 996 favored keeping the school open.

In a small café in Kellogg, over coffee and butter horns, Lou and Joyce Horvath talk about how much improvement there's been in the environment since they came here in 1954, when Lou—now a guidance counselor at the high school—got a teaching job. "Last year there was a beaver up by Smelterville, fishing in the South Fork," says Lou, incredulous. "I don't know that I'd eat any fish out of there myself, but the river *is* coming back." Outside, the morning haze has burned off, leaving an infinitely blue sky. "The company has done a lot to improve the living here," says Joyce.

Lou is a good-humored man, cheerfully rotund, with sparse brown hair and a closely trimmed salt-and-pepper beard. A Democrat who serves in the predominantly Republican Idaho House of Representatives, he was one of the minority who voted to retain the state's Air Quality Bureau (now defunct). About a year ago, in response to a request from an attorney

involved in the lead damage suit against Bunker Hill, he searched school records for evidence of behavioral or other problems that might be related to lead. "I couldn't find anything that would show anything either way," he says. "Our kids were National Merit semifinalists regularly. Their scores on various tests were about the same as at other schools. There was nothing to prove or disprove they'd been hurt."

The Horvaths raised three children here. One of them had a learning disability in math. Another had rheumatic fever. Joyce has asthma. There are still many days when the sulfur dioxide confines her to her home in Pinehurst, four miles west of Kellogg. A thoughtful, articulate woman with a doctorate in education, she has read the reports, listened to the experts, and she is left with a vague feeling of unease.

"Did we make a mistake, staying here?" she asks, quietly. "Our son's learning disability, did we cause that just by living here? Was it due to lead or something else? You know, it's awfully difficult for people to say that they themselves might have been responsible for something going wrong with their children. Why didn't we move? I don't know." Her eyes, behind glasses with gray plastic rims, are solemn. "We just don't *know* enough. How can you evaluate something that might have been, something that's not there, like a split-hair level of intelligence?"

There is silence at the table, broken by Lou: "Well, OK, what the whole thing comes down to is that you need some real good long-term research. And where's the money going to come from? You have the company put up the money and the first thing people are going to say is that they bought the results. In the Legislature, we're cutting back tremendously on what we spend on the environment. And the federal government is cutting back tremendously.

"You know, Joyce and I have talked about where we are going to live when we retire. We've got a farm in north-central Idaho. Well, that's out, because of the dust from the farm plus all the agricultural chemicals in the air. There are spray planes going around that place all the time. So where else is there? Los Angeles? Love Canal? Three Mile Island?

"You sort of wonder: where do you go?"

Long battles over levels of lead that are allowable in the air, and in people's bodies, leave a lingering cloud of uncertainty about the health of the town and its children, whose lives seem quite normal now.

Against a lowering sky, horses are led back to the barn after a race in the annual West Falkland

By Fred Strebeigh

A lonely but free life at the southern edge of the world

The Falkland Islands are about as remote as a place can be, but most who live there wouldn't want to be anywhere else

Photographs by Fred Strebeigh and Martin Rogers

sports meeting. Style of horse gear was introduced by South American gauchos in the 19th century.

The ketch *Ilen* purls over seas flecked with sunlight, brindled with kelp. Cape Horn lies off our bow, 450 miles southwest. On deck and in the hold, huddling from the chill wind, some 200 sheep are packed tight as crated grapefruit. Dolphins play beneath the bowsprit. Magellanic penguins swim in our wake.

Mariners for centuries have dreaded these stormy latitudes, below the 50th parallel, which they call "the furious 50s." Here the west winds, hitting almost no land, whirl virtually unimpeded around the globe.

This old ketch will never reach Cape Horn. Today, the skipper tells me, we "shift sheep." Tomorrow, "gather bullock." Ship and crew are at home here, coasting the twisted islets and inlets of the Falkland Islands, the largest remaining colony of the old British Empire in the world.

In size, the Falklands are equivalent to Connecticut, but splattered as two large islands, East and West Falkland, and 200 smaller ones. No ferries link the islands. No paved roads cross them. Three little planes provide the only service for travel over water or distance. Flights to the islands come but once or twice a week from Argentina, the islands' only geographical neighbor—called by many simply "the coast." No direct passenger service, ship or plane, ever comes from England —which most Falklanders, even natives for many generations, quite incongruously still call "home."

The Falklands, with only 1,800 people, more than half of whom live in the capital town of Stanley, have fewer inhabitants per square mile than the state of Alaska. But though vast and often rugged, the Falkland landscape is pastoral almost to its last acre. "Everything in the islands," people will say, referring to imported necessities that range from Land-Rovers to hospital supplies to Guinness Stout, "has to come off the backs of the same 640,000 sheep."

The sheep do the job. Exporting almost nothing but raw wool, the islands maintain a phenomenal trade surplus. In some recent years wool sales have exceeded the cost of all imports by more than two to one —a ratio usually achieved only by oil-producing nations. But this is no oasis for wool sheiks. Most land is owned in Britain. Large profits leave the islands. What remains is a scant population, hard-working and self-reliant.

The four-man crew of the *Ilen*, joining sometimes with another four-man ketch, tends 18,000 sheep on 60 islands along the south shore of East Falkland—all owned by the Falkland Islands Company, largest of the British farm companies holding land in the colony. The *Ilen* crew lives on ship or in shanties. Often for as long as six weeks they do not see their home port, Goose Green, population 140. They shear and butcher sheep, herd and slaughter cattle, mend fences and boats. Working 12 hours a day, they earn overtime and spend almost nothing. As their skipper, Stephen Clifton, says, "It's a free sort of life."

Though in command of *Ilen* for two years, Stephen still looks less like a seasoned sailor than a ruddy-faced schoolboy—perhaps because he became skipper at age 16 (p. 86). The islands have more work than people, an unemployment rate that in effect runs below zero, and so, as Stephen says, "men are hard to come by."

Stephen and his seagoing shepherds travel a coast

Fred Strebeigh, free-lance author and photographer, is also a tutor in writing at Yale University.

Skipper Stephen Clifton (left) and crewman Ian McKay "shift sheep" aboard the ketch *Ilen*.

that remains almost as undeveloped as when the first man discovered it—a man presumably European. Native Americans never inhabited these islands.

A British explorer, John Strong, made the first landing in 1690. Putting ashore to "inspect the inhabitants," his crew found penguins, "mustered in infinite numbers" (hardly an exaggeration: the present population exceeds ten million).

France made the first settlement in 1764. British settlers came the next year. Spain bought out the French and then in 1770, with five frigates, threw out the British. After Spain's empire crumbled, Argentina inherited its hold on the islands, known in Spanish as the "Islas Malvinas." In 1833 the British took the islands back, beginning a 150-year dispute with Argentina over their sovereignty—which conceivably could pass to Argentina as a result of negotiations now being held between the two nations.

In any event, the pattern that today defines life in the Falklands was cut in their early years. Now, as then, the population is almost totally British, and almost totally separated, by both language and politics, from the continent that lies only 250 miles away. Bound intimately to their own land and emotionally to Britain, linked but tenuously to the rest of the world, Falklanders have learned to do for themselves. Every Falkland woman is her own butcher, each man his own car mechanic. Families and friends make their own fun.

Social problems are almost nonexistent

"People here," says Stephen Clifton, "don't know what it is to have television sets or nightclubs. Saying is: 'What you never have, you never miss.' "

Other things not missed in the Falklands are, by and large, traffic jams or pollution or social unrest. No one goes hungry or cold, especially in the farm communities, where meat, milk and housing are free for all; home-heating fuel comes free also, cut from peat bogs, dried and burned.

The *Ilen* docks at Goose Green and I meet Tony Blake, an energetic New Zealander with eyes so blue the sky seems to shine through them. Within an hour, at his invitation, we are driving toward North Arm, the East Falkland farm he manages for the Falkland Islands Company.

"This is the smoothest camp driving in the Falklands," he says as his four-wheel-drive Land-Rover lurches onto the beaten tracks heading south. The "camp," taken from *campo*, Spanish for countryside, is everything beyond the town of Stanley and its 20 miles of paved roads. "North Arm is 30 miles from here—only three hours," says Tony, seeking a smooth path through the rough fields.

Shepherd Dave Hurst, his dog and 4,300 sheep participate in a "sheep gather," the Falkland form of roundup. Wool is the islands' only export, and it comes off the backs of some 640,000 animals.

Before coming to the Falklands in 1972, Tony worked as a farmer and agricultural lecturer in New Zealand, the world's number-two exporter of wool, after Australia. Why move to the Falklands?

"I wanted to run a big farm," he says. "At home a typical place is 1,000 acres. Here I've got 67,000 sheep on 307,000 acres."

We halt for a flock of upland geese, the tastiest of Falkland wildfowl, and apparently even more numerous than sheep. With two shotgun blasts, Tony bags five birds. The rest of the flock doesn't fly away. They stroll. "Amazing," says Tony. "But with so few people there's almost no hunting pressure."

Cresting a rise, we come on North Arm settlement, some 30 houses and sheds strung along a narrow estuary. Above the settlement stands Tony's 24-room home. "They say the Victorian era is over," he says, "but the manager still has the big house on the hill."

Over dinner, Tony and his wife, Lynn, reflect on the role of farm manager. "People hold you up as a paternal figure and come to you with every problem," says Tony, "from filling in their taxes to marrying them to sending emergency medical messages over the radio to Stanley." The government provides each farm manager with a radio-telephone, obliging his family to pass on, and be privy to, most urgent settlement transactions.

Besides radio, the only rapid communication is along the telephone line—a single low-fidelity strand of steel fencing wire, which runs from North Arm through three other settlements and some 60 phones. With such party lines, Falklanders can raise eavesdropping to an art. The most clever of them wire the telephone line to their transistor radios, allowing them to turn their neighbors' conversation into family entertainment.

This loss of privacy can, of course, be annoying. Tony and others tell a story of one farm manager, bedeviled by eavesdroppers, who plugged his telephone line into a 240-volt wall socket. Across the island, the story goes, radio speakers burst like popcorn.

Though phone and radio offer some break in the solitude of Falkland camp life, the great break comes once each year at the week-long sports meetings held

At the end of a long day driving sheep, Dave Hurst cooks mutton—what else?—over a peat fire.

"Old Sue" Binnie is an outside shepherd, one who chooses to live far beyond island settlements.

The settlement of Fox Bay East, population 36, at sunset. Tip of a bay is seen at the left. Numerous

at one farm on each large island at the end of summer.

I set off by plane, flying over dark sea and then treeless plains to Chartres settlement, host to this year's West Falkland sports. When I arrive, half the island population of 360 has already gathered above the settlement by a rough racecourse. Old men and 12-year-olds press to the window of a ramshackle betting stall, posting wagers. Shepherds and managers, women and men, brothers and daughters hurtle down the course on all the horses they can find (p. 91).

inlets create a ragged coastline, many of them providing fine harbors. Although their income is derived from the camp, Falklanders live close to the water because all wool is transported by ship.

Darkness comes. We all troop down from the races to dinner. At their home, Bill and Pat Luxton, managers and part owners of Chartres farm, have 27 guests. Everyone sets tables, washes dishes, makes beds.

In the mornings we are awakened for gin and tonics before breakfast. Then come sheep-dog trials, foot-races, shearing contests, steer riding.

Everyone is exhausted but each night we dance. The woolshed, its wooden shearing floor polished by hard boots for decades, is the ballroom. Yards of burlap that some day will wrap wool for shipment now cloak walls and ceiling. Stored on the floor above our heads, filling the dance hall with the rich aroma of lanolin, sit 30 tons of loose wool. We dance as if within an enormous bale, dimly lit.

Saturday arrives and everyone bids farewell to friends they may not see until the next sports. The approaching winter brings isolation. The temperature in the Falklands rarely goes below freezing and there is little snow, but the slight winter sunshine fails to

The Reverend Gerald Smith whitewashes his fence in front of world's southernmost Anglican cathedral.

dry the porous peat soil of the camp. Overland travel becomes tortuous and rare.

From Chartres, I went south to Fox Bay to meet a man whom everyone calls "Old Sue" (p. 88).

"He's a real gentleman and the last of the old-time Falklanders," said one shepherd at the sports. "When he was a boy you were worked like dogs, and he doesn't know times have changed."

Horace "Sue" Binnie is an outside shepherd, one of a dwindling number who choose to live and tend pastures far outside the island settlements. Though employed by farm companies, they work beyond the gaze of managers—"pretty much your own boss," they say.

I looked forward to meeting Sue, at least in part because Falkland lore seems to hold a special place for the outside shepherds. Remote and self-sufficient, long on old stories but short on new listeners, caring for the land of someone else as if it were their own, utterly free within narrow limits—the outside shepherds seem a bit like the islands themselves.

"Sue and his wife Rosie," one man told me with evident admiration, "haven't left West Falkland since World War II." I met them over tea at their home, Coast Ridge House, a miniature settlement with stables, cow shed, meat house and garden. Sue said he was off the next day to gather sheep, and asked if I would like to come.

From rough hillsides and lush swales we round up some 4,300 sheep, then drive them meandering before us, back toward Fox Bay (p. 87). The day grows warm, the flock sluggish. Sue's dogs are sure how fast a drive should travel. As it slows they move in, barking at heels and ignoring shepherd's orders. Sue keeps rocks in his shirt pocket and, when words fail, he throws them at his wayward dogs. He aims to miss. They cower, feigning contrition. Both sides understand.

Wanting a small hold in the colony

We rode on, talking. Just before we parted, I asked Sue if he ever wanted to see places beyond West Falkland. "No," he said instantly. Then he changed his mind. "One thing I'd love to see is some of the great concert halls. We get good reception here on the radio, but I think I'd like to *be* there. And I'd like to see a real good opera singer."

Far to the north, just off the edge of West Falkland, Fenton Hirtle is planting tree seedlings in front of his family's new home, the only house on Golding Island. "I've saved years for a place like this," he says.

His house is old and his pastures poor, but they answer a lifetime dream, not just for Fenton but for many others. For more than half his 40 years, Fenton had done every sort of farm job from laborer to acting manager. Always he looked for land. Until Golding

Into the stretch at the West Falkland sports.
Everyone races—shepherds, managers, wives, kids.

Falkland penguins outnumber humans 5,000 to one.
These gentoos head in after a hard day of fishing.

Square-rigger *Lady Elizabeth* in Stanley Harbor. Built in 1879, she hit rock in 1913, was later beached.

Island was sold recently by a big company, no new farmland had gone on the market for 20 years. Large landholders have argued that small farms are not viable, despite the good health of the few in existence.

In roughly the same two decades, the Falkland population has suffered the only serious decline in its history, falling by more than 400 since the mid-1950s.

"Ten families left the colony just last year," he says, "and we'd have been off too, for New Zealand. There I knew I could buy a farm."

Then Golding and eight neighboring islets went on sale. The price was £18,500, not easily saved in a land where the average income in 1979 was £2,910 ($6,170). The Hirtle family paid cash.

"There's so many people," said Fenton, "who just want their small hold in the colony. There's so much to do—soil to improve, trees to plant. But people have got to believe that if they plant a tree they'll be able to watch it grow."

I had to stay two weeks more than planned on Golding, waiting while the Falklands' planes kept conking out and the 40-knot "woollies" blew, keeping the sea in froth. The Hirtles never complained as my visit became a layover. Finally the wind slackened, and I was off to Stanley, the capital.

By the end of the harbor as we fly in, a splendid square-rigger rests hard aground but heeling as if hard on the wind (above). A century old and 223 feet long, her massive yardarm still swaying in the breeze, the *Lady Elizabeth* recalls the time when Stanley was a port on the trade routes of the world.

Because of its fine harbor, Stanley was made the Falklands' capital in 1845, a timely choice. Three years later gold was struck in California. Hundreds of vessels, many unfit for heavy sea, set out for the aptly named Golden Gate. The first port downwind from the Horn, Stanley reaped its windfall, building a thriving industry on repairing crippled ships and marketing the salvaged cargoes of ruined ones.

But many ships that limped to Stanley were not worth the cost of repair. Condemned as unfit for the sea, they were snapped up by islanders and put to use as floating storage hulks or as beached warehouses and jetties. Now slow decay may finish the destruction.

"The ships, the 'old hulks' as they're called, are a part of the islands' heritage that Falklanders are just beginning to care about," said John Smith, a native of England who for 20 years has made Stanley his home and its ships his passion. "We want to preserve them, but it's financially beyond the resources of the colony."

Leaving its past behind, I set out to explore modern Stanley. Any first-time visitor can see why families in the camp view the town's life of convenience as bordering on decadence: four pubs, two schools, 15 stores, three churches, paved streets. While most camp settlements have a "milk man" who brings milk to the door in the early mornings—packaged in cows ready to be milked—in Stanley it comes ready to drink, often packaged in old whiskey bottles.

Uncertainty about the future

To walk through Stanley is to be assaulted by cheeriness and goodwill. Children stop a stranger in the street to ask who he is. Everyone bids greeting. I walk along Drury Street, down Barrack, past tidy homes—silver with green and blue trim, pink and beige with orange and yellow trim—made vivid by creative paint. Near the town's center towers the world's southernmost Anglican cathedral. On the ground beneath its spire, whitewashing the fence that surrounds Christ Church Cathedral, kneels the Reverend Gerald Smith, its rector (p. 90). "Clergyman's knee doesn't result from too much saying of prayers," he tells me. "It comes from too much painting of fences."

Toward the west end of town stands Government House, home and offices for Governor James R. W. Parker. "My role here," he tells me, "is as a sort of autocrat." The governor, widely respected in the islands, presides over meetings of the Falklands' two governing councils, whose members are popularly elected. "We have a system that is almost wholly democratic," he says, "except that of course I am appointed by the Queen."

Much of the work of island government, quite understandably, is limited to the allotting of slim revenues. The British government sends some financial assistance but, at least until recently, the taxes paid directly to the British exchequer, on income derived from Falkland farms by British companies and their shareholders, have exceeded all support returned by Great Britain to the islands. That is, possession of the Falklands has not only yielded Britain a naval outpost but yielded a profit as well.

Now, however, particularly as speculation arises about oil deposits beneath the seas around them and as Britain and Argentina meet regularly to discuss the islands' sovereignty and economic development, Falklanders have come to fear that Britain will trade them away, perhaps partly in exchange for a profitable arrangement by the two nations for oil exploration. Falklanders have made it clear that they wish to remain under the British rule, and Parliament ministers have given assurances that no change will occur that is unacceptable to the islanders. Still, the sovereignty talks continue.

"The greatest threat to these islands," one farm manager told me, "is continued uncertainty. Once there is a decision, even say that in 20 years there will be a handover to Argentina, then at least people can decide what to do. Of course most would leave, but there are some who might remain."

For now, what remains is the uncertainty. Falklanders must live with their odd lot—that hard work can bring self-reliance but, apparently, no independence. They are simply too small, and suspended between two powers—the alien "coast" and the faraway "home" —that are too great.

One thing is certain. Those who leave the Falklands, for whatever reason, will not easily forget them. I think back to one morning at North Arm, spent riding with Lynn Blake across the open land at dawn as skeins of whistling upland geese flew by, over rippling golden plains toward the midnight blue ocean beyond.

"The longer we stay," Lynn said, "the harder it is to leave. I love the life, love the space, love the miles. Of course there are squally days, storms. You never know if you'll be off for a picnic or just sitting by the fire. But when people use words like 'barren' and 'windswept,' to me they just fire the imagination."

Two youngsters get ready to race in the sports. Sheepskins are typical of gear inherited from the gauchos. Negotiations between Argentina and Britain may well affect the future of these children.

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Watch the birdie but puh-*leeze* don't say 'cheese'

Captivated by cheap postage and their new cameras, Americans made and exchanged photographic (and poker-faced) postcards

Earnest young man in an ill-fitting suit contrasted sharply with stylishly starched and sashed companion.

The craze swept the country in the years before World War I. Like the hirsute and patriotic old gent in the moon at left, thousands of Americans composed themselves—sometimes amid preposterous props—in front of cameras that produced postcard-sized negatives. When the prints were made, they mailed their emulsified images to friends and relatives far and wide.

Cars and long-distance telephone calls were just beginning to bring people within reach of one another, but were not yet commonplace. With pictures of themselves at work or posed in a studio (where it seems that no one ever smiled for the birdie), of children and pets, or of local events, people could exchange small news and short messages of friendship.

The card phenomenon resulted from several factors. In 1898, the U.S. Post Office announced that Rural Free Delivery would be provided for groups of farmers who petitioned their Congressmen. Until then, free home delivery had been made only in towns of 10,000 or more. The Post Office also established a reduced postage rate for privately printed postcards. The fever for picture postcards already raging in Europe now spread to America (SMITHSONIAN, April 1974).

In 1902, the Eastman Kodak Company took advantage of the booming fad by issuing a postcard-size photographic paper on which images could be printed directly from negatives. Other companies followed suit. "Gaslight" paper was simple to process and sensitive enough to be printed at night using artificial light —hence the name. Determined amateurs began making their own postcards in increasing numbers when Eastman manufactured, in 1903, the No. 3A Folding Pocket Kodak Camera to take postcard-size negatives.

Many professionals produced postcards (including some shown on these pages) almost exclusively. With elaborate backdrops that set their subjects against a more exotic world, and with the newly available electric lights, they were able, 60 years before Apollo 11, to send their customers to the moon.

A venerable patriarch sat for his patriotic portrait (here enlarged) on a sturdy paper moon in a studio.

This has been adapted from Prairie Fires and Paper Moons, The American Photographic Postcard: 1900-1920 *by Hal Morgan and Andreas Brown, published this month by David R. Godine, Boston.*

Copyright © 1981 by Hal Morgan and Andreas Brown

According to messages on these cards, Gladys Herbst (above), age four, sat in the "BB flat Bass Horn" of Hubbert Doud one October day, 1910; Lizzie Brown (upper right) seemed to be a neat, if perplexed, housekeeper; and Baby Anita (right) posed in Kansas for Grandma.

Albert sent his friends best wishes from Lynn, Massachusetts, about 1910.

Avoiding real risks of flash pictures, one man set up his best friend outdoors.

Frank Moravec was proud of his job as plasterer and sent cards to prove it.

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Living well is the best revenge.

B and B. A blend of Benedictine and fine Cognac.

Julius Wile Sons & Co. New Hyde Park, N.Y.

Two dauntless walkers en route to California were recorded in a studio.

Sisters or simply pals, these young women gussied up for their postcard.

All we know about the "overall twins" is the date on the card: July 20, 1910.

The tattooist's art of Charles Wagner (upper left) was pictured about 1920, advertising unisex needlework. Exotic, too, was Amalie's card (above), which touted her as "the tallest living lady in the world." One sober tot (left) appeared to hatch from a studio egg.

"There are still huge reserves of American oil left behind in oil fields that were tapped thirty or forty years ago," says Gulf Area Engineer John Shamburger. "In those days, crude was only two or three dollars a barrel, so we would operate an oil well only as long as the oil could be pumped up easily and inexpensively. It made more sense to drill new wells than to squeeze every drop out of old ones."

"In many of these old wells, the underground pressure is so low that the oil won't come up without some extra help. The extra help is called tertiary recovery, and it's a whole technology in itself. Here at Heidelberg, Mississippi, we started experimenting with it in 1971.

"One way to build up underground pressure is to set fire to some of the oil deep in the earth. That's called fireflooding. It drives the rest of the oil toward the well, where it can be pumped to the surface. The improvement can be pretty dramatic; in one case, production increased from one hundred to 2300 barrels per day.

"In other parts of the country, with different geology, we might use water, steam, or chemicals to get the oil flowing."

All over America, Gulf is using one or another of these technologies to get more oil out of old wells. It isn't cheap and it isn't easy, but it is a certain source of made-in-America energy for tomorrow.

Gulf

Gulf people: energy for tomorrow.

© Gulf Oil Corporation 1981

"Gulf's underground heat treatment gets more oil from old oil wells."

Was this doggy card a joke? Or the inspiration of a doting pet owner sometime around 1906?

A World War I soldier looked ready to wrap up in Old Glory to demonstrate his patriotism.

As frail water tank collapsed (left) in Vermillion, South Dakota, on May 7, 1909, W.H. Lawton made a photographic record to sell as postcards. Signing himself the "Buck Killer," a hunter (above) complained of "rhumtism" to his "Friend Carl."

An Atlantic City card (enlarged) immortalized James Taylor's 1906 sand sculpture, "Cast Up by the Sea."

CAST-UP
BY THE
SEA

Tenneco will drill more than 400 wells this year in search of more energy.

Tenneco is a leading producer of natural gas in the Gulf of Mexico.

Compressor stations such as this keep natural gas moving through Tenneco's 16,000-mile system.

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And, as a pipeliner with a 16,000-mile system, Tenneco delivers over five billion cubic feet of natural gas a day. To keep this volume of gas flowing, we have contracted for more supplies in each of the last two years than we delivered to our customers.

With the supply situation improving and government deregulation in the offing, natural gas will play a key role in meeting the nation's energy needs far into the future. So will Tenneco.

Although energy provides more than three-fourths of Tenneco's income, we continue to supply other basic needs, like food, construction and farm equipment, chemicals, ships, automotive components, packaging, and insurance.

That's Tenneco today: growing in energy ... and more.

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Private Collection

Weidenfeld & Nicolson Archives

This self-portrait appeared in 1877 letter in which he wrote that "I shall go south like the swollers."

By Joseph Kastner

The runcible life and works of the remarkable Edward Lear

A master of nonsense verse and limericks, he was also an accomplished artist whose paintings of birds rival those of Audubon

In the summer of 1846, having been favorably impressed by the landscape drawings in a new book entitled *Illustrated Excursions in Italy*, Queen Victoria summoned the artist to her palace to give her lessons in drawing. Though she had just had her fifth child, the industrious young queen could still manage an instructive pastime.

Her teacher showed up at the palace gate, casually dressed and vaguely informative. "I've come to see the Queen," he announced. The guards held him off politely; then he suddenly explained: "Oh, I'm Lear." An equerry took him for an "amiable lunatic" until Lear thought to mention that he had an appointment.

Brace of culmenated toucans is one of ten plates Lear contributed to 1834 edition of *Family of Toucans*.

The Queen found him a most helpful teacher. "Had a drawing lesson from Mr. Lear," she wrote in her diary for July 15, "who sketched before me and teaches remarkably well in landscape painting in water colours." Next day she wrote: "He was very pleased with my drawing and very encouraging. . . ." A later entry was a little more cautious: ". . . am, I hope, improving." She must have felt she was, because she kept on for a dozen lessons.

That summer with the Queen was just one high point in a highly eventful year for Edward Lear. His two-volume *Illustrated Excursions* established him as both a skillful landscape painter and an engaging travel writer. Another aspect of his art appeared in an impressive volume called *Gleanings from the Menagerie and Aviary at Knowsley Hall*, published by the Earl of Derby. It included, as its prize exhibits, a number of paintings of birds done by Lear and they reaffirmed his place as the best natural-history artist Eng-

Thorpe Collection, Cooper–Bridgeman Library

This macaw sat for his portrait at London's Zoological Gardens and appeared in Lear's own book on parrots.

land had ever produced. The birds in this volume were ornithologically correct and irreproachably sober, not at all like the implausible creatures usually associated with Edward Lear—the raven who danced a quadrille with the Old Man of Whitehaven, the alphabetic Queer Querulous Quail or the Rural Runcible Raven or that most romantic inspiration of the mixed-up muse of nonsense, the Owl who went to sea with the Pussy-Cat.

This species was involved in another Lear event of 1846, the publication of a small volume called *A Book of Nonsense*. Lear himself considered this so minor an incident in his career that, instead of putting his name on the title page, he used a silly little pseudonym, Derry down Derry. So far as he was concerned, he would ensure his place in posterity with his much-admired work as a nature painter and, later, with his landscapes. Posterity crossed him up. Only in the past few decades has it finally come to value Lear as a no-nonsense artist. It is, of course, his books of nonsense that have made him immortal.

Contradiction was always intruding on Lear's life. He had rare talents as a landscape draftsman in line and watercolor, works often tossed off as potboilers. He tried to concentrate his ambitions on large-scale oils which were, at best, mediocre. He had the instincts of a fine romantic poet. There are echoes of Coleridge in his lines: *Below her home the river rolled/ With soft meloobious sound,/ Where golden finned Chuprassies swam,/ In myriads circling round.* And there is a Byronic sweep to *When awful darkness and silence reign/ Over the great Gramboolian plain. . . .* These are lovely and stirring images. But how does a meloobious sound sound? And where is Gramboolia?

Lear was asthmatic, susceptible to bronchitis, almost sightless in one eye. Yet he traveled restlessly and recklessly, gasping through the rarefied air and stumbling through the sulfurous ash at the cone of Mt. Etna, assaulted by desert bandits at Petra, in what is now Jordan, stoned by superstitious Albanians. He was the most open of men in his affections, a welcome suitor to several women, aching to love and be loved. Yet he kept from the world two secrets: he was a closet homosexual and a closet epileptic.

Just as there was a logic that tied sense into his nonsense, there was a logic that tied Lear's life together. For example: the elegant birds he painted as an ornithological artist were linked to his rowdy creations that made nonsense their habitat by the fact that in 1831 Lord Stanley, eldest son of the 12th Earl of Derby, was looking for an artist to portray the denizens of the enormous private menagerie he had col-

The author, a frequent contributor to SMITHSONIAN, *writes on natural history. His last appearance, in September 1980, was a spirited defense of weeds.*

Thorpe Collection, Cooper–Bridgeman Library

Lear received a commission to draw raptors, including this kite, and large birds for *Birds of Europe* series.

National Portrait Gallery, London

When W. N. Marstrand sketched him in 1840, Lear was busy with his work, Rome's sights and giddy society.

lected. Edward Lear was recommended and Lord Stanley went to the London zoo to look Lear over.

Lear was in the birdhouse at the Zoological Gardens doing paintings for his book *Illustrations of the Family of Psittacidae or Parrots.* Surrounded by parrots, he sketched them as they perched and flew, measured them while they shrieked avian profanities at him. Watching him at work, seeing the lines come magically to life on Lear's sketch pad, Stanley knew that this was his man and soon Edward Lear was ensconced as artist-in-residence at Knowsley Hall near Liverpool.

He was only 20 years old, yet he had been a professional artist for five years. The 20th of 21 children, Lear was raised by an older sister who gave him love and educated him at home. She taught him to draw and paint, particularly flowers and birds. By himself he learned enough ancient Greek to make a translation of Plato for his own use.

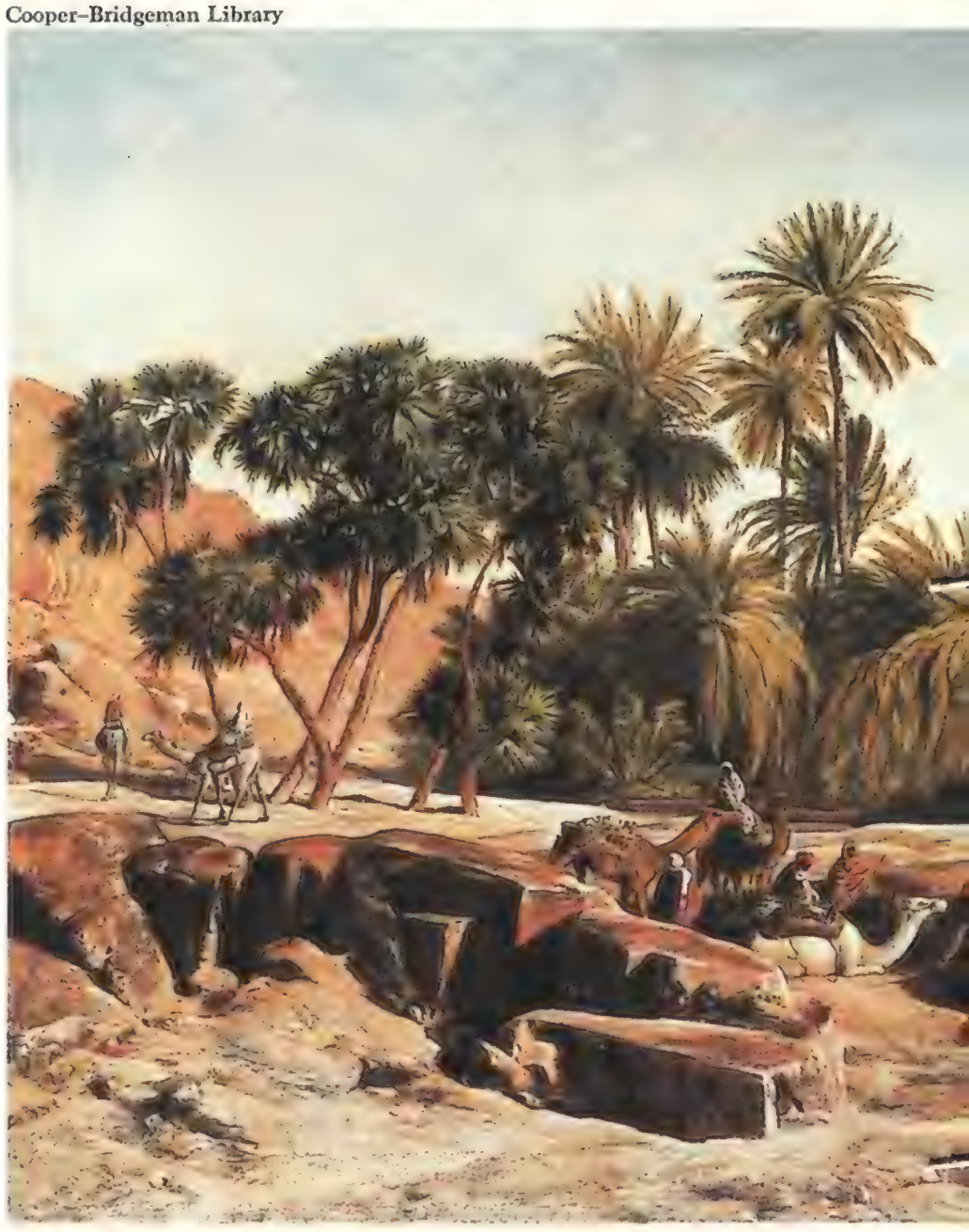
When he was 15 he began earning a living by doing sketches, screens and fans for shopkeepers and making what he called "morbid disease drawings, for hospitals and certain doctors of physic." Awkward but attractive, talented as well as diligent, he interested people of influence and was retained to make drawings for a best-selling *Illustrations of British Ornithology* and other books. He then set out to do his own book, drawing the birds and also preparing the lithographic plates; it established his reputation. This precocious work by an artist untrained in either art or natural history was widely praised and his meticulous yet lifelike birds were ranked with Audubon's.

At Knowsley Hall, Lear moved into an exhilarating new world. The patriarch, the Old Earl of Derby, had founded the famous horse race at Epsom Downs. His eldest son, an enthusiastic naturalist, had built an enormous menagerie with monkeys, pumas, mongooses, emus, guans, cranes, tortoises—eventually more than 1,500 specimens of more than 400 species.

Linnean Society

Tiptoeing *Testudo radiata* was one of 40 tortoises in Thomas Bell's monograph. Lear lithographed plates.

Cooper–Bridgeman Library



Philae on the Nile, oil, lacks freedom and charm of sketches Lear made on 1854 trip to this "real *fairy*

The Old Earl, whose first wife had run off with a duke and whose present wife had been an actress (a lady on stage, gossip said, and an actress off), never had fewer than 40 for dinner and 100 at table was not uncommon. Shortly after Lear arrived, the Earl noticed that the grandchildren and great-grandchildren would leave the dinner table as soon as they politely could and dash off below stairs. Inquiring, the Earl learned that they were gathering in the steward's dining room where the new zoological artist was entrancing them with ridiculous rhymes and improbable drawings about *a young lady of Portugal, whose ideas were excessively nautical,* who drew people who looked like owls and vice versa, who meted out poetic injustice by bringing good people to bad ends, and who was always making fun of big noses, like that Old Man's *on whose nose, Most birds of the air could repose;/ But they all flew away, at the closing of day,/ which relieved that Old Man and his nose.* Lear always felt his own nose was abnormally large, though it really wasn't, and the big nose is a leitmotiv through all his writing and drawing.

Instead of declaring the steward's quarters off limits, the Old Earl brought the star attraction upstairs to dine and socialize with the family. Edward Lear became not just a retainer at Knowsley but a guest and good friend. The friendship lasted through several successions to the title. "Fancy," Lear wrote some 50 years later, "having worked for 4 Earls of Derby."

Lear's nonsense at Knowsley was expressed in the limerick, a form he did not invent, though people take it for granted that he did. (Though the origins of both the form and the name "limerick" are uncertain, such poems were known in England around 1820.) But the zany variety that Lear brought to it established the limerick as the universal verse form it has since become. His limericks, it should be said, were often violent and uncharitable, but they were always chaste.

The *Book of Nonsense,* in which his first efforts were published, was a success right off. But because it was signed "Derry down Derry," people began to guess at who the real author might be. Though he had deliberately avoided taking credit for himself, Lear became considerably annoyed when it was given to anyone else. When an enlarged edition was published in 1861, he put his name firmly on the title page. People still did not believe it. Lear told of riding in a railway carriage with an old gentleman, as well as two little boys who had a copy of the nonsense book and were convulsed by its verse. The old gentleman informed them that the author was not Edward Lear but the Earl of Derby. "Edward is the earl's first name," he said knowingly, "and Lear is only 'earl' transposed." Lear kept quiet until the gentleman added: "There is no such person as Edward Lear."

"As my hat was, as well as my handkerchief and stick, largely marked inside with my name, and as I

island." He and friends camped out in ruins of Temple of Isis, held nightly dinner parties on its terrace.

Linnean Society

Shy Malayan ground squirrel at Knowsley was drawn from life for the book on Lord Stanley's menagerie.

happened to have in my pocket several letters addressed to me, the temptation was too great to resist, so, flashing all these articles at once on my would-be extinguisher's attention, I speedily reduced him to silence."

At Knowsley, Lear met, as he put it, "half the fine people of the day." Among the aristocracy and on its fringes, where he moved for the rest of his life, he found close friends as well as generous patrons. Always, and with everyone, he was wary, concealing what he considered his shameful affliction, epilepsy. It was probably a persistent but not disabling form called petit mal. He himself always referred to it in his diaries as the "Terrible Demon." For years, going through the diaries, scholars puzzled over entries interspersed with cryptic crosses and numbers. Finally it dawned on them that each cross indicated a seizure and the numeral the frequency with which it had occurred that month—as often as 20 times.

His general weak health finally made the damp climate at Knowsley an impossible place for Lear to live, and after four-and-a-half years Lord Stanley, now the 13th Earl, and a nephew, generously gave Lear money for a stay in Italy. Taking a studio in Rome, Lear established a pattern that would carry through his life: a stay in Italy or the Mediterranean, visits to England, back to the Mediterranean, travels in Greece, Egypt, the Middle East, India, back to England, Italy—Lear always longed to settle down somewhere, yet he always got up and went somewhere else.

His failing eyesight dictated that he leave natural history. In Rome, in 1837, he found he could sell enough landscape sketches, lithographs and watercolors, supplemented by teaching, to make a living.

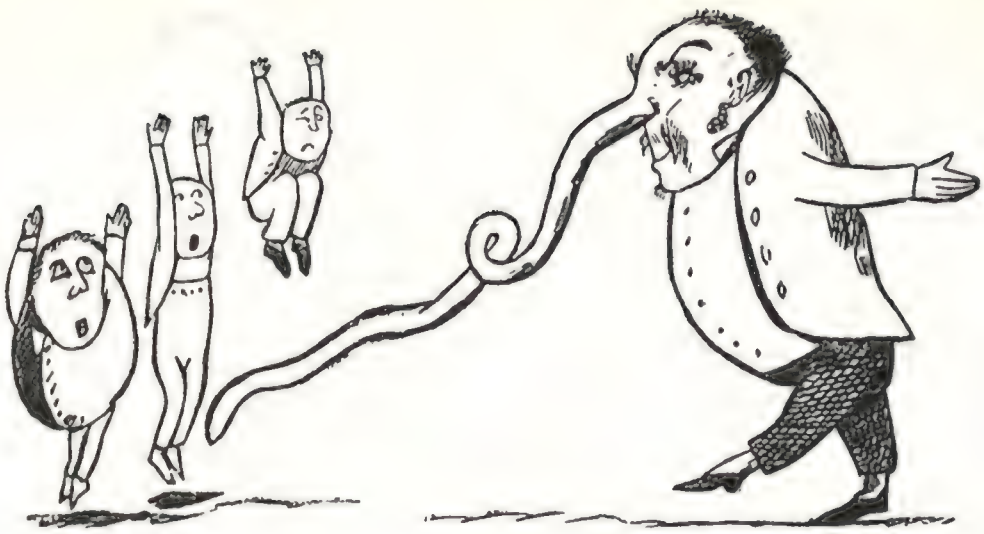
Publication of his *Illustrated Travels* brought him home to England and the lessons with the Queen. Welcomed as a guest at the palace, as he had been at Knowsley Hall, he learned some lessons in court etiquette. He had a habit, when conversing with the Queen, of standing at the fireplace, his back to the fire. Whenever he did this, a Lord-in-Waiting would come over and insist on showing him something of interest on the other side of the room. Later, he was given to understand that no one ever stood between Her Majesty and the fire.

The Queen herself was not at all put out. One afternoon she took Lear off to show him some of her magnificent collection of miniatures. Overwhelmed by the display, Lear burst out: "Oh! Where *did* you get all these beautiful things?" In a kindly, conclusive manner the Queen replied: "I inherited them, Mr. Lear."

All told, Lear wrote and illustrated seven travel books. His text was delightful to read and useful to follow, paying scrupulous attention to vital statistics of prices, distances, lodging, while making light of discomfort and danger. Readers were told that the peasants at the village of Calli had good manners but that the pigs of Avezzano did not: charging down through

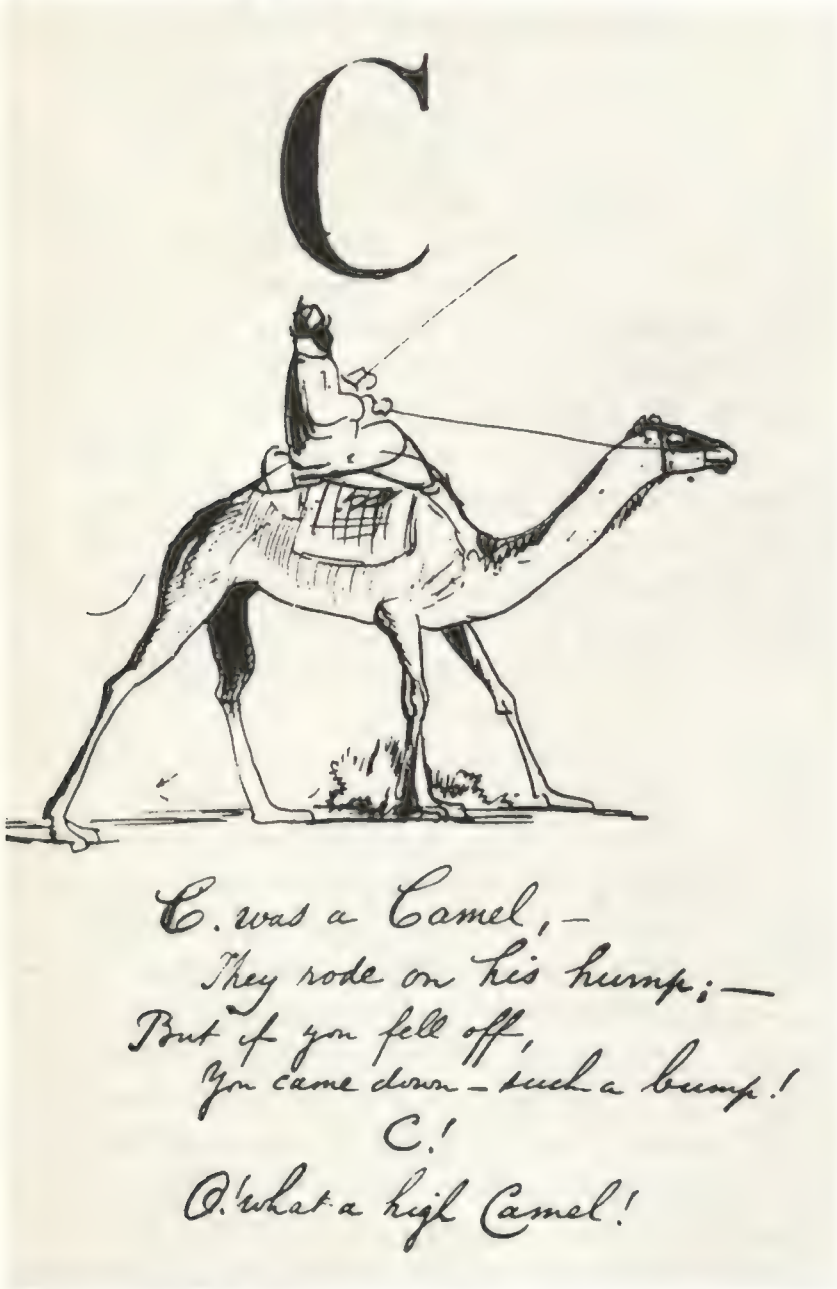
Justin G. Schiller Collection, New York

Proud of his garden of exotics and local flora, he sketched it in an 1872 letter to artist Penry Williams.



There was an Old Man with a nose,
who said, "If you choose to suppose,
That my nose is too long,
you are certainly wrong!"
That remarkable man with a nose.

© Lincolnshire Library Service



Lear loved to draw and color alphabets for children. This was for Lord Tennyson's sons Hallam and Lionel.

the town square at the end of day they would engulf the sightseer in a veritable "pigstorm." He told travelers to expect "vermin of two species (politely called B flats and F sharps)" and to have uninvited guests share the bedroom. He also told of two doves that spent the night on his coverlet "moaning dismally" and of being kept awake by some ducks "who kept looking at me as if they wished I were corn or duckweed."

Though his books were well received, his steady income came from his watercolors, some of which he turned out by the score through his own method of mass production. He would set up some several dozen sheets of paper in various sizes in his studio, go to his enormous file of sketches made in the field, draw a different scene on each sheet. Then he would walk from sheet to sheet, on one round filling in all the greens, next time the blues, and so on. "Tyrants," he called these works, but he finished them at the rate of one a day. In a few days they brought him £120.

They were good art, never mechanical or trite. But when Lear turned to the oil paintings that were his special pride, all the life and individuality that blessed his watercolors vanished. His oils were stiff, characterless and academic, noted mainly for their accuracy.

Lear did have some oils hung at Royal Academy shows. A few were bought by friends, just to be helpful. Nor does anyone care much about the oils today. The watercolors and sketches, however, which were selling for five shillings years ago, are now collectors' prizes. The best collection is at Harvard's Houghton Library, which also owns Lear's diaries and has become the main center for Lear scholarship.

He moved in the most eminent Victorian circles and was a close friend of the Tennysons, especially the poet's wife, Emily. He idolized her. "I should think,

There was on Old Man with a beard,
who said, "It is just as I feared!—
Two Owls and a Hen,
four Larks and a Wren,
Have all built their nests in my beard!"

There was an Old Person of Dutton,
whose head was so small as a button;
So to make it look big,
he purchased a wig,
And rapidly rushed about Dutton.

computing moderately," he wrote, "that 15 angels, several hundreds of ordinary women, many philosophers, a heap of truly wise and kind mothers, 3 or 4 minor prophets and a lot of doctors and school mistresses, might be boiled down, and yet their combined essence fall short of what Emily Tennyson really is." He was less effusive about her husband. "Alfred," he wrote in his diary after a visit, "was expansive and offensive." But he admired Tennyson's poetry and, though untrained in music, composed and published settings for several of the laureate's poems. He would sing them on request in a thin tenor that often brought tears to his listeners' eyes.

Emily Tennyson, who tried to be a matchmaker for Lear, once wrote telling him how much his singing had affected a young lady. "I am afraid you will not believe me when I tell you what a hero of romance you are. How Miss Cotton was found all pale after a sleepless night. . . ." Lear, who saw himself realistically as an awkward and unromantic figure, did not pursue the hapless Miss Cotton. From time to time he would meet willing young ladies and think of proposing to them, but never did. After meeting Gussie (Augusta) Bethell, daughter of a Lord Chancellor, he wrote in his diary: "Absolutely good & Sweet & delightful. BOTHER!" A friend discouraged him from proposing to Gussie, saying she had no money. But mostly Lear discouraged himself. "The risk of marriage," he wrote, "of making 2 people more unhappy than before. . . . Better suffer alone than cause suffering in others."

His truest love actually was a man, Franklin Lushington, a poetically inclined barrister several years younger than Lear, who traveled with him through Greece in 1849. They picked wild flowers "like children," wrote Lear in remembered ecstasy, "and stuck our hats & coats & horses all over with them. . . . They were the happiest days of my life." He became closely attached to at least two other men, but it took years to get over his love for Lushington who, after marrying, remained Lear's good friend.

If he could not have love, Lear could have affection and he cherished his friends, getting up before dawn to write as many as 30 or 35 letters to them. They were full of puns and elisions and made-up words and spellings. "Do you think," he asked the Tennysons, "there is a Pharmouse or a Nin somewhere I could come see you and Mrs. Tennyson promiscuously?" He would talk about his "eggsybissions," describe a "narmchair," mourn that "all is obskewer," complain about his "phits of coffin."

"Sich is phame," he wrote when he was favorably mentioned in a House of Commons debate. Lear's prose has to be read very carefully, as S. J. Perelman or Woody Allen have to be, lest the reader be lulled into letting a joke slip by unnoticed. He will mention "perfect and abject happiness," describe a scene of "peculiar and trivial splendor," comment on "the serene and sickly suavity known only to the truly virtuous."

For all his humor, Lear was often drenched with sadness. "I am doing little but dimly walking on along the dusty twilight lanes of an incomprehensible life," he wrote. "I wish I were an egg and was going to be hatched." He could be morose and testy and was among the most accomplished grumblers of his time. He was tired of England, he wrote Emily Tennyson, "demoralized by years of mud and fire and gnats and rheumatism, small beer and stupid horses and coalfire and cholerambusses and midnight atmospheres all the year young— I am growing mustaches in signs of going elsewhere." He finally went to Italy for good, building

Lear made up words for their sound, had a runcible hat, cat, spoon, wall, goose—and state of mind.

The Owl and the Pussy-Cat went to sea
In a beautiful pea-green boat,
They took some honey, and plenty of money,
Wrapped up in a five-pound note.
The Owl looked up to the stars above,
And sang to a small guitar,
"O lovely Pussy; O Pussy, my love,
What a beautiful Pussy you are,
You are,
You are!
What a beautiful Pussy you are!"

himself a house at San Remo in 1871, and publishing that year a third nonsense book, *Nonsense Songs, Stories, Botany and Alphabets.* His first book of nonsense had gone into two editions. The enlarged edition published in 1861 in his own name sold out in weeks. "It is queer," he wrote a friend, "that I am the man as is making some 3 or 4000 people laugh in England all at one time." But he got little money out of them. He sold all the rights to the 1862 edition to his publisher for £125. He lived to see it go into a couple of dozen editions in his lifetime.

Lear's first two nonsense books were devoted entirely to limericks; four later books contained stories, botanical drawings (Tickia Orologica was a stalk hung with watches), alphabets and, most important, poems. The nonsense poems are a quantum jump ahead of the limericks in expressing Lear's peculiar genius. The poems are full of fun, too, but also of feeling. Their preposterous and convincing imagery takes them far beyond whimsy. The childlike lilts run them quickly through the mind, but their strange and dark allusions leave unsettling fragments in the memory. Lear's style can be extravagant:

When Storm-clouds brood on the towering heights
Of the Hills of the Chankly Bore:—
Then, through the vast and gloomy dark,
There moves what seems a fiery spark. . . .
"The Dong, The Dong!
"The Dong with a luminous Nose!"

Or, as in his wry *Incidents in the Life of My Uncle Arly*, his style can be sparse:

O My agèd Uncle Arly!
Sitting on a heap of Barley
Thro' the silent hours of night,—
Close beside a leafy thicket:—
On his nose there was a Cricket,—
In his hat a Railway-Ticket;—
(But his shoes were far too tight.)

Naturally, the analysts have got around to finding dark implications in Lear's lighthearted poems. The Dong with the luminous Nose, searching for a long-lost love, is a symbol of phallic frustration. Uncle Arly is obvious allegory: the barley is Lear's eking out his existence; the ticket his wanderings; the cricket is the chirper of nonsense that never left him; the tight shoes the painful armor of secrecy he always wore.

Masters of nonsense

Even *The Owl and the Pussy-Cat* can be wrapped in enigmas: why did the cat, instead of devouring the bird, propose marriage—or is it the same thing; why should the wedding ring come from a pig's nose? What matter; *The Owl and the Pussy-Cat* remains the most musical, happiest nonsense poem ever written.

That other master of nonsense, Lewis Carroll, was writing at the same time Lear was and comparisons between the two are constantly made. Both were sexually pallid bachelors, meticulous in their work, fond of children and afraid of dogs. Their work shares the same quality of being utterly reasonable in a far-fetched way, of being convincing in specific detail and implausible on the whole. Lear wrote most in verse and his expressive freewheeling illustrations were part and parcel of his genius. Carroll, while his poems at least match Lear's, wrote mostly in prose and,

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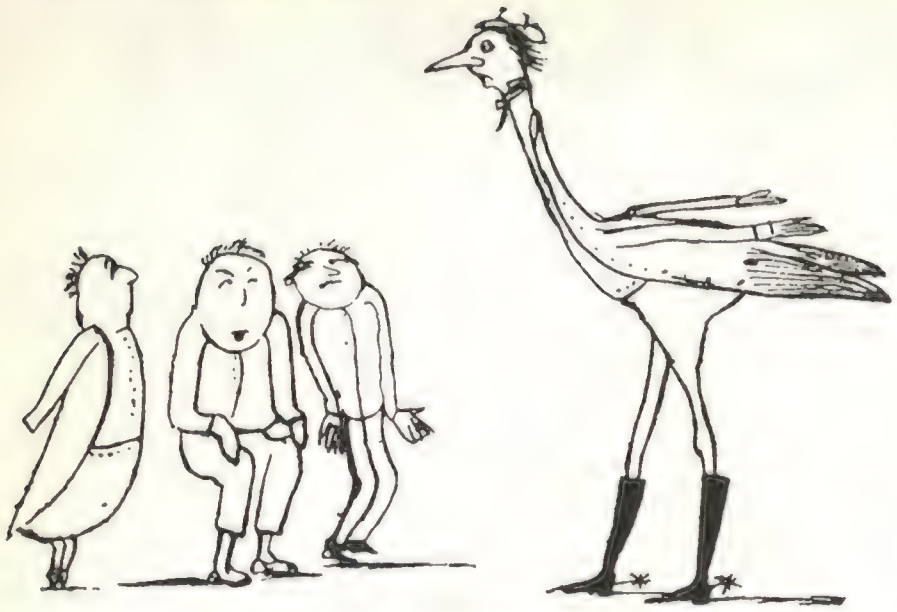

There was an Old Man of Dumblane,
Who greatly resembled a Crane;
But they said,—"Is it wrong,
Since your legs are so long,
To request you won't stay in Dumblane?"

though he drew well, let others illustrate his work.

Certainly Carroll must have read Lear and vice versa; but neither ever mentioned the other in writing nor, as far as anyone knows, did they ever meet though they moved in the same circles. Things grow curiouser and curiouser when their relations with the Tennysons are brought up. Both were friends of the poet. Lear illustrated Tennyson's poems and Carroll did an index to his *In Memoriam*. Both were frequent guests at the Tennysons' yet—was Emily being tactful—never at the same time. Independently, Lear and Carroll perfected modern nonsense just as their contemporaries Charles Darwin and Alfred Wallace, at the far sides of the world, came independently to the theory of evolution.

Once he settled permanently in Italy, Lear kept to his maxim: "Always have ten years' work mapped out before you, if you wish to be happy." But one eye failed him completely and painting was difficult. The house on which he had spent almost all his money lost much of its value when its magnificent sea view was blocked by a new building. Even old patrons long ago lost interest in buying his oils. Yet he was heartened when John Ruskin, the voice of Victorian authority, wrote: "Surely the most beneficent and innocent of all books yet produced is *The Book of Nonsense* with its corollary carols—inimitable and refreshing and perfect in rhythm. I shall put [Lear] first of my hundred authors." And the current Earl of Derby, great-grandson of the old Earl who brought Lear upstairs, said he would welcome some of his recent work: "There is space still at Knowsley for a few more of your drawings, though I have a pretty good stock already."

When a young lady he knew told him that a friend had remarked: "How pleasant to know Mr. Lear," he promptly sat down and dashed off a verse:

How pleasant to know Mr. Lear!
Who has written such volumes of stuff!
Some think him ill-tempered and queer,
But a few think him pleasant enough.
His mind is concrete and fastidious . . .
His beard it resembles a wig. . . .
He reads but he cannot speak Spanish,
He cannot abide ginger-beer:
Ere the days of his pilgrimage vanish,
How pleasant to know Mr. Lear!

His pilgrimage ended in 1888, in his 76th year. Ill, half-blind, his mind worn with worries about money, he still held his life and work together. He persisted in his ambitious project to illustrate 124 Tennyson poems and completed about 200 sketches. His almost-fiancée, Gussie Bethell, came to see him. Ironically, she had inherited considerable money, had married an invalided older man, now was a widow. Once again Lear was torn—". . . if I shall or shall not ask Gussie to marry me. . . ." He didn't. He kept on working and writing, mocking his own misery: "He only said, I'm very weary. The rheumatiz, he said, It's awful dull and dreary. I think I'll go to bed."

He did leave one poem unfinished. It was found scribbled on some endpapers in his much-read copy of Addison's *Spectator* papers—it is suitable that the favorite reading of a man who tried to turn the English language upside down was the writing of a man who tried to keep it on an even keel. The fragment is a sequel to *The Owl and the Pussy-Cat* and is full of blank spaces that Lear never filled in. It begins:

Our mother was the Pussy-Cat,
Our father was the Owl,
And so we're partly little beasts
And partly little fowl. . . .
We all believe that little mice,
For food are singularly nice.

The pussycat had fallen from a tree, the fragment explains, and was never seen again. The family still had the pot in which the honey had been taken, but all the money was gone, along with the five-pound note it was wrapped in.

But the owl was as indomitable as his creator. He had lost his love, he had lost his money but he had not —nor had Lear—lost himself. The poem goes on:

Our father still preserves his voice,
and when he sees a star
He often sings — — — — to that original guitar.

Bootless, and with their wings feathered rather than fingered, flamingos show Lear at his graceful best.

Thorpe Collection, Cooper-Bridgeman Library

FLAMINGO.
Phœnicopterus ruber. *Linn.*

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By Joseph S. Levine

Chemical warfare flourishes among the creatures of the reef

Swimmers beware: many fish, invertebrates, come equipped with potent toxins. A mistake can be painful—even, in some cases, fatal

As long as humans have known the sea, they have feared its real and imagined inhabitants. Mermaids lured men to watery graves, giant clams trapped unwary swimmers, and death from the unknown lurked in every underwater cave. The modern era of undersea exploration has dispelled many—perhaps too many—of these old fears, and today the weightless world of the coral reef with its sponge-lined caverns and pastel skyscrapers seems far removed from the menacing images of the past.

It is true that humans are not the preferred prey of any reef animals, and we can—with care—cavort among the brightly colored fish with reasonable impunity. The reef creatures themselves, however, face a constant battle for life and livelihood in an environment as perilous as its vistas are scenic. Fish and invertebrates alike must continually locate and capture their prey, while simultaneously ensuring that they themselves do not become the prey of others. As part of their adaptations, reef animals have evolved an array of protective poisons and offensive toxic weapons as bizarre and as potent as any designed by Jules Verne. It is easy to see the function some of these toxins serve in the struggle for existence. Others, however, whose potency is no less formidable, present still-unsolved mysteries to scientists who strive to understand their biological purpose. Be that as it may, swimmers, waders and even fishermen are well-advised to learn at least a little about the no-holds-barred chemical warfare waged beneath the calm blue waters of coral lagoons. This knowledge will simultaneously enable them to appreciate a few of the wonders wrought by evolution, and allow them to avoid unnecessary close encounters of a very painful kind.

Two basic types of dangerous chemical compounds occur in nature, as highlighted by the title of Dr. Bruce W. Halstead's magnum opus on marine toxins: *Poisonous and Venomous Marine Animals of the World* (p. 178). The term *poison*—although it can refer to all toxic compounds—is usually reserved for those substances that do their harm after having been ingested. *Venoms*, on the other hand, are those toxins that are physically injected into the victim by means of spines, fangs or stinging cells.

Man has known for centuries that certain animals are dangerous to eat; practical knowledge of specific poisonous fish dates at least as far back as the written records of the ancient Middle East and China. Poisonous pufferfish have been identified among the hieroglyphic inscriptions of Fifth Dynasty Egyptian tombs

The burrfish, related to porcupinefish and puffers, is highly poisonous during certain times of the year.

Photographs by Jeffrey L. Rotman

Conspicuously frilled lionfish not only doesn't flee from divers, but will attack when it feels threatened.

When approached from side, fish will roll over to confront the threat with long, venomous dorsal spines.

(about 4,700 years old), and it has been suggested that certain of the Biblical dietary laws may have been designed to eliminate the poisonous marine animals of both the Mediterranean and the Red Sea from the diets of the Israelites. Many puffers are now known to carry large amounts of the extremely poisonous *tetrodotoxin*. In a similar vein, early Chinese medical texts warned against the periodically harmful nature of fish now known as potential carriers of *ciguatoxin*.

Both tetrodotoxin and ciguatoxin are powerful nerve poisons or *neurotoxins* that interfere with the transmission of impulses across the gaps (synapses) between nerves and those between nerves and muscles. Paralysis, loss of sensation and sensory hallucinations are common to both types of poisoning.

Deaths due to tetrodotoxin continue because several species of poisonous puffers, known as *fugu* in Japan, are highly prized by Oriental gourmands who pay upwards of $25 a pound for these fish. When properly cleaned as *sashimi*, the meat from most species of *fugu* is considered "relatively safe," but other forms of preparation involving the internal organs entail greater risk. Despite careful training and government licensing of *fugu* chefs in Japan, *fugu* fanatics—who are said to relish the mild euphoria, hot and cold flashes, and tingling sensations afforded by "controlled" doses of the poison—still periodically succumb following the injudicious ingestion of too much tetrodotoxin.

The biological role of ciguatoxin is less clear. It has an unpleasant propensity to crop up without warning in locations and in fish species that have previously been perfectly safe. Certain species of dinoflagellates, living in conjunction with brown algae, may be responsible for ciguatera poisoning. The poison is accumulated by plant-eating fish that exhibit no outward signs of their acquired toxicity, and gain no obvious benefit. Like DDT, ciguatoxin is concentrated by carnivorous fish further along in the food chain, making the carnivores at the top especially deadly. To compound the problem, it is common for members of a fish species caught on one side of an island to be edible, while members of the same species caught on

The author, an assistant professor of biology at Boston College, is also a research associate at the Marine Biology Laboratory in Woods Hole.

the other side are highly toxic. The reasons why are still not understood.

Moving from poisonous animals to venomous ones, it is tempting to characterize the latter as malignant demons that eagerly await any opportunity to pounce on hapless humans. The truth of the matter is that most encounters between humans and venomous reef animals occur either by accident or because of outright aggression on the part of the humans. Common reef animals that use their toxins to capture food are too small to regard a human as prey, so confrontations are usually unpremeditated on both sides and do little good for either party. Some fish and invertebrates cover themselves with defensive spines. Awareness of the potentially dangerous organisms in an area and a few simple precautions are usually all that is needed to stay safe in the water.

This torpedo ray uses electric shock; stingrays are equipped with venomous barbs in their tails.

Sting like a Millepora

Perhaps the most conspicuous of the marine animals that use venoms to capture their prey are the members of the phylum *Cnidaria*: corals, sea anemones, jellyfish and hydroids. Most possess stinging structures called *nematocysts*, poisoned darts that wait tightly coiled inside tiny venom sacs. Contact causes these nematocysts to shoot out of the sacs that contain them, and to inject their venom into the prey as they penetrate. Most nematocysts are designed only to incapacitate small fish or even smaller planktonic organisms, and are either too weak to penetrate far into human skin or are equipped with venom too feeble to affect creatures as large as ourselves. Certain Cnidarians, however, possess both physically powerful nematocysts and highly toxic venom. *Millepora*, the so-called fire coral, is one. Actually a member of the class *Hydrozoa*, it is not a true coral at all but a relative of the familiar freshwater *Hydra*. *Millepora* forms branched colonies of individuals called *zooids*. Since the colonies are completely immobile, they must be brushed or touched for stinging to occur. Left alone, fire-coral zooids simply spread their tentacles in the current, snagging whatever planktonic morsels drift their way. Divers careless enough to allow themselves to be pushed onto a bed of fire coral by the surf, however, can be stung rather sharply on the chest and arms while being scraped by the colonies' abrasive calcium skeletons.

An entirely different picture is presented by another hydrozoan, *Physalia*, the infamous Portuguese man-of-war. Hanging from the shimmering, pale-blue, bell-shaped floats are almost invisible stinging tentacles that can trail for yards. Since the coiled nematocysts do not need a central nervous system to fire, tentacles broken off in storms and even those washed up on beaches remain dangerous for some time. *Physalia*

Venom from this jellyfish can disable small prey; other species can inflict painful stings on humans.

A few drops of venom from *Octopus macropus* injected into a crab produces instantaneous death.

nematocysts are armed with a neurotoxic venom that causes severe, sharp or shooting pain followed by headaches, chills, shock or even hysteria, depending upon the number of stings inflicted.

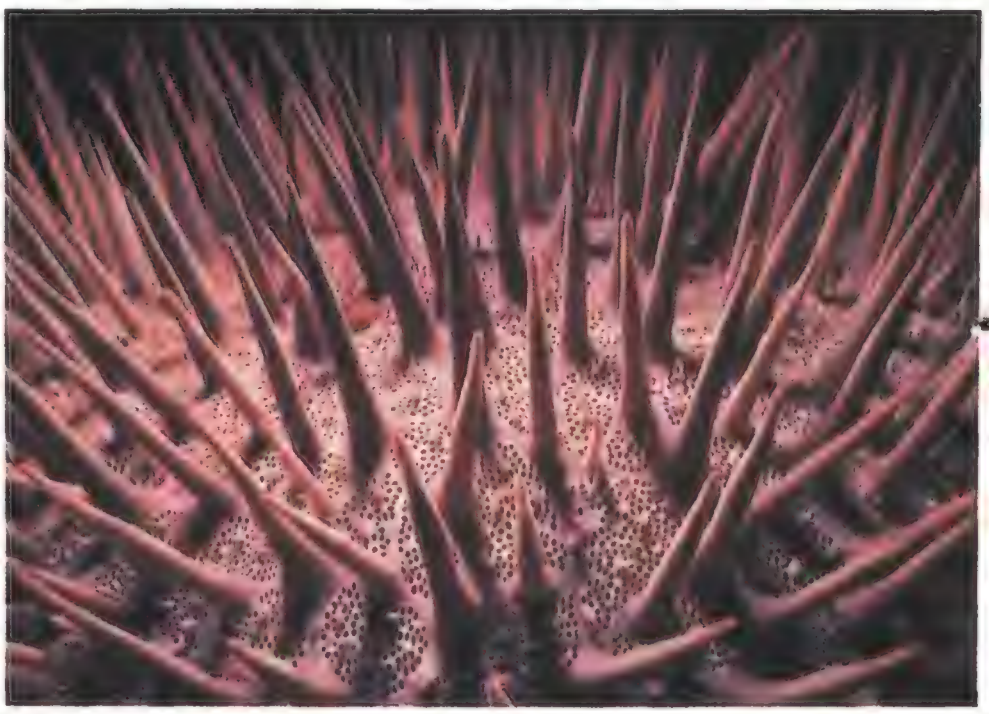
The threat from *Physalia* stings pales into insignificance, though, when compared with the danger presented by sea wasps. Sea-wasp stings cause such immediate, intense pain, muscular spasms and paralysis that swimmers can easily drown before the venom itself does them in. Severe stings can be fatal by themselves, however, although an antivenin has been developed. Fortunately for most of us who spend a lot of time in the sea, the most dangerous species in this genus are restricted to a relatively small area of the tropical South Pacific.

Another familiar invertebrate group with some species dependent on venom to catch their prey is the phylum *Mollusca*, which includes snails, clams, octopuses and squid. Although monster octopuses and squid (kraken) have always been fodder for horror movies, normal-sized venomous cephalopods are shy and retiring by nature and usually attack only when provoked. Venomous octopuses and cone shells use their toxins to paralyze and subdue a variety of small worms, fish, crabs, shrimp and other molluscs. When captured and handled indiscriminately, though, they exhibit little reticence in applying their venom to humans. Cone shells attack using a long, flexible proboscis tipped with an ejectable, venomous tooth that sinks easily into the flesh of their prey. The feeding apparatus of the octopus includes two pairs of venom-producing salivary glands that inject the toxin into the open wound made by the powerful, parrotlike beaks. The neurotoxic venoms of both cone shells and octopuses have been known to cause death in humans.

Among the more unusual-looking of the potentially venomous habitués of tropical seas are the members of phylum *Echinodermata*: starfishes, sea urchins and related forms. Their five-part external skeletons are covered with spines that are either fixed solidly to the shell or are connected to it by elaborate ball-and-socket joints (below, right) that enable the spines to be moved around at will. Also characteristic are flexible, inflatable, suction-cuplike tube feet which allow both urchins and starfish to move around, and which provide starfish with their fabled ability to pull apart clams and mussels. Even stranger than the tube feet are the *pedicellariae*—sets of fanglike jaws located on the ends of flexible stalks.

The only really venomous starfish is the fearsome-looking *Acanthaster planci*, the coral-eating Crown of Thorns (below), which received so much attention some years ago (SMITHSONIAN, April 1970). Careless brushes with this ponderous creature can result in deep puncture wounds that can be quite painful, but the animal could never be accused of attacking.

Urchins should be approached with care since even those lacking venom usually have spines that are both sharp and brittle. Easily broken off once they enter the flesh, these barbed "punji sticks" can work their way deep into muscles and joints, causing long-term irritation. In some species of urchin, both the spines and the *pedicellariae* are equipped with venom glands that continue to inject their toxin even after they have become separated from the animal. Intense pain, swelling and aching can be accompanied by partial paralysis in severe cases, but the worst symptoms rarely last longer than several hours. Generally secretive by day, urchins emerge from their coral crevices to forage along the reef as twilight approaches, so evening and



Spines of the Crown of Thorns starfish are covered with a layer of venom. Divers try to avoid them.

nighttime swimmers should be especially careful.

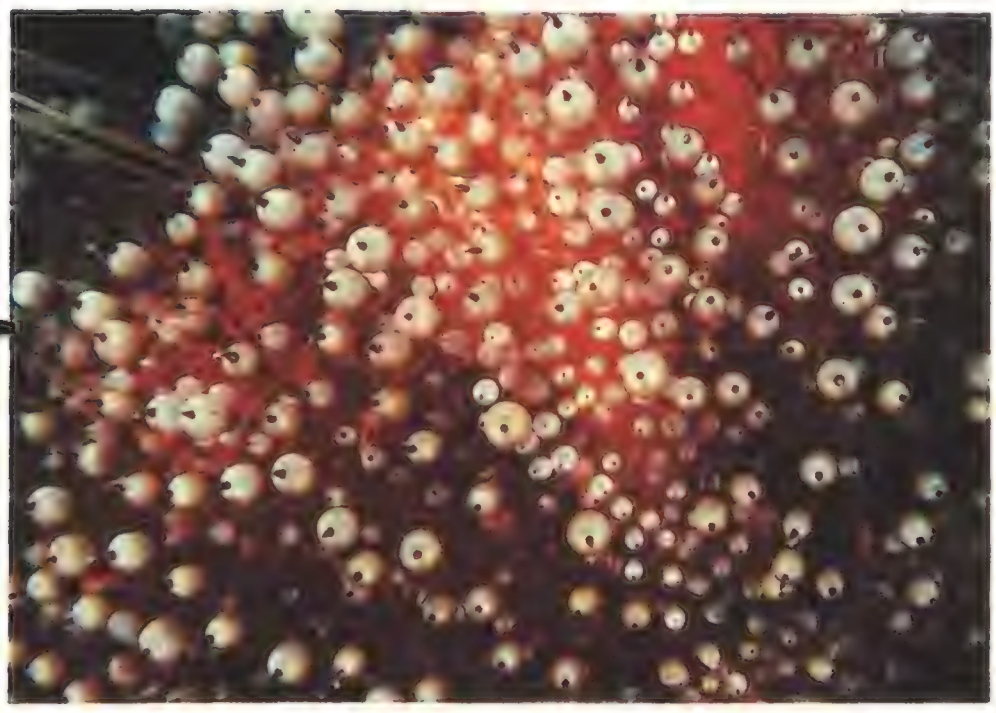
Stingrays have acquired particularly unsavory reputations that really are not warranted. These fairly common cartilaginous fish can inflict serious wounds; the barbed stings kept carefully sheathed on the tails of these animals can penetrate deep into human limbs, ripping gaping holes lined with venom as they are pulled out. There have even been rare cases of deaths from stingray stings, and the symptoms are no less unpleasant than the others we have discussed. Stingrays, though, really do mind their own business, which entails lying around half-buried in soft sand, grubbing for worms and molluscs. Rays usually lash out with their tails only when stepped on, a provocation that would doubtless incite similar retaliation from any of us. They would much rather move out of harm's way than attack, so the simple precaution of shuffling along a sandy bottom instead of goose-stepping usually clears them safely out of the way. Torpedo rays, which use electricity rather than venom, also would rather flee an intruder.

A number of the more advanced, bony fish sport venomous spines, but most keep them concealed until their moment of use as defensive last resorts. Tangs and surgeonfish sheath razor-sharp spines in scabbards on either side of their tail bases. These generally timid creatures change their dispositions rapidly if hooked, speared or cornered, baring their swords and fiercely slashing attackers.

Two groups of commercially valuable food fish, the weaverfish and the rabbitfish, are equipped with various combinations of dorsal, pectoral and gill-cover spines backed up with venom that makes their wounds far more distressing than their small size would indicate. Rabbitfish wounds are painful, but the agony that follows weaverfish stings is legendary among fishermen from the Mediterranean to Scandinavia. One man actually amputated his own finger in a desperate attempt to rid himself of the excruciating pain of a weaverfish sting. The lesson here? When fishing in unfamiliar waters, check with local fishermen and carefully scrutinize anything unfamiliar on the end of a hook before grabbing it with an exposed hand or bringing it into the boat.

Probably the most spectacular and bizarre venomous fish belong to the family *Scorpaenidae*, whose most dangerous members are restricted to the Pacific. Venomous scorpaenids can be divided by appearance into two types: the frilled and lacy lionfish and turkeyfish and the magnificently camouflaged stonefish and scorpionfish. The lionfish are among the most ornate fish to be found on the reef (p. 122). All of their long curving fin spines are covered with delicate tissue that ripples majestically as the fish glide slowly through the water. They use their fanlike pectoral fins to corner a victim slowly before making a sudden lunge and gulp that sucks in their prey faster than the eye can follow. Lionfish never approach divers, and virtually never commit unprovoked attacks, but they are quick to respond if they feel threatened, erecting their dorsal spines and making quick, jabbing movements in the direction of the threat. Lionfish stings can be terribly painful. Their venom combines neurotoxic action with powerful hemolytic activity that destroys blood cells in large numbers, causing serious tissue damage.

While divers maintain a healthy respect for lionfish,



Globular sacs of venom completely enclose tips of spines of Red Sea urchin, *Asthenosoma varium*.

Sea urchin spines not only puncture but break off and work their way in—and some are poisonous to boot.

it is stonefish and scorpionfish (opposite) they should fear the most. Stonefish (below) sit ensconced amidst corals and algae or partially buried in soft sand. These ambush hunters rely on their ability to mimic the features and colors of their surroundings to hide from potential prey until the victims are within gulping distance. Unfortunately, the camouflage conceals the fish from human eyes as well. Unlike rays, which can usually be counted upon to swim away when confronted with human feet, stonefish are just as likely to stand their ground and attack, jabbing at intruding limbs with dorsal spines erect. Stonefish venom produces such pain that even minor wounds frequently cause victims to thrash about in agony and may cause them to lose consciousness. Immediate flushing of the wound, antivenin or luck may enable victims to survive death by cardiac or respiratory paralysis, but persistent paralysis of the extremities, tissue damage and even long-term general ill health frequently result from stonefish stings. For these reasons a knowledgeable diver uses caution in walking, sitting or poking around tropical Pacific reefs, usually carrying a short, stiff stick or pole to prevent accidental wave-caused brushes with rocks, coral and sea urchins: it can be used to avoid brushes with stonefish as well. There's no shame in using the stick like a blind person's cane, tapping it to investigate both rocky and sandy areas before sitting or standing on them.

For scientists working with poisonous and venomous organisms, our current lack of knowledge of biological toxins is at least as distressing as the physical threat itself. There is, to be sure, a great body of knowledge on the subject; the revised edition of *Poisonous and Venomous Marine Animals* runs to some 1,325 pages. The information, though, is spread out thinly over hundreds of toxic species from all the world's oceans. Halstead's book is peppered with phrases like "No knowledge is available on the nature of this toxin," "No antidote is known," and even "Pathology, Chemistry, Toxicology—Unknown."

Modern Western science has been able to make antivenins for only a few of the more potent venoms of the Indo-Pacific area, and effective antidotes for poisons are even fewer. Native Pacific islanders have accumulated a sizable list of plant remedies for stings and poisonings. Only recently have Western scientists realized that, just as these people often know best which species are poisonous and when, they may be on to something in the way of antidotes. Researchers from Japan, Australia and the United States are now analyzing plants used in island medicine to determine which might yield useful curative chemicals. Similarly, although our brand of science has been unable to come up with a simple, reliable test to indicate the presence of ciguatoxin in newly caught fish, some islanders claim to be able to detect the poison by observing the behavior of flies around suspected meat. These and other local superstitions are finally getting the serious attention they deserve.

Some toxins themselves have proved useful in health-related research, but we have barely begun to realize the full biomedical potential of marine toxins. Research will tell us more about both benefits and dangers. In the meantime, if faced with suspicious sea creatures you don't recognize in an unfamiliar environment, be certain to check with local people before treating them as you would a pet or a potential meal. When in doubt, "Look—but don't touch."

A stonefish, one of the most venomous creatures in the sea, lies well-camouflaged on the bottom.

Equally hard to see, a scorpionfish waits in ambush for prey. This fish will also attack an intruding diver.

10 good reasons to

(No other electric

When you buy a Smith-Corona® cartridge electric portable, you get a lot more than a typewriter. You get a *total typing system.*

That's because our unique cartridge ribbon system lets you change from fabric to clean, crisp film (like the expensive office machines have) in a snap—literally. And your typing always looks just right, no matter what.

Best of all, there are two different ways of correcting. And both of them are easy, quick and effective. There's our new Lift-Rite™ correction cartridge, which works with its own companion film ribbon. It actually *lifts* mistakes right off the page! Which means you can type more neatly than ever before—and on any color paper. And our Re-Rite® cartridge covers mistakes with a thin white impression.

How Smith-Corona corrections are different (and better).

Now, it's true that other electric portables have correction systems. But none of them work like the Smith-Corona system does. For one thing, no other portable has a cartridge that snaps in and lifts off mistakes.

For another thing, the Smith-Corona correction system lets you erase whole words, sentences, even paragraphs without the time-consuming single correction backspacing you have to do with many other portables and even some office typewriters.

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The typewriter at the center of the system.

When you buy a Smith-Corona cartridge electric portable, you're buying a typewriter that's built to last. It's still made to the same exacting quality control standards that have made Smith-Corona a household word for "typewriter."

Smith-Corona typing *looks* the way typing should look. Crisp, clean, straight-as-a-die, and absolutely even. And Smith-Corona has more authorized typewriter service centers than anyone else in America—just in case something ever does go wrong. (And we might add, a Smith-Corona electric portable comes with a carrying case worthy of the machine it carries.)

So there are really ten good reasons to buy a Smith-Corona. Nine unique cartridges, and a typewriter built to give you years of dependable use. Which is something no other electric portable in the world can give you.

Smith-Corona. Makes your words (and your mistakes) sing. (Like no other portable.)

1. Lift-Rite correction cartridge. Lifts mistakes right off the page.

2. Lift-Rite black film cartridge. The companion film for Lift-Rite correction.

3. Re-Rite correction cartridge. It works with cartridges 4-9.

4. Black film cartridge. Like the professionals use.

5. Color film cartridge. Red.

buy a Smith-Corona.

portable has them.)

10. The Smith-Corona electric portable. The center of the system.

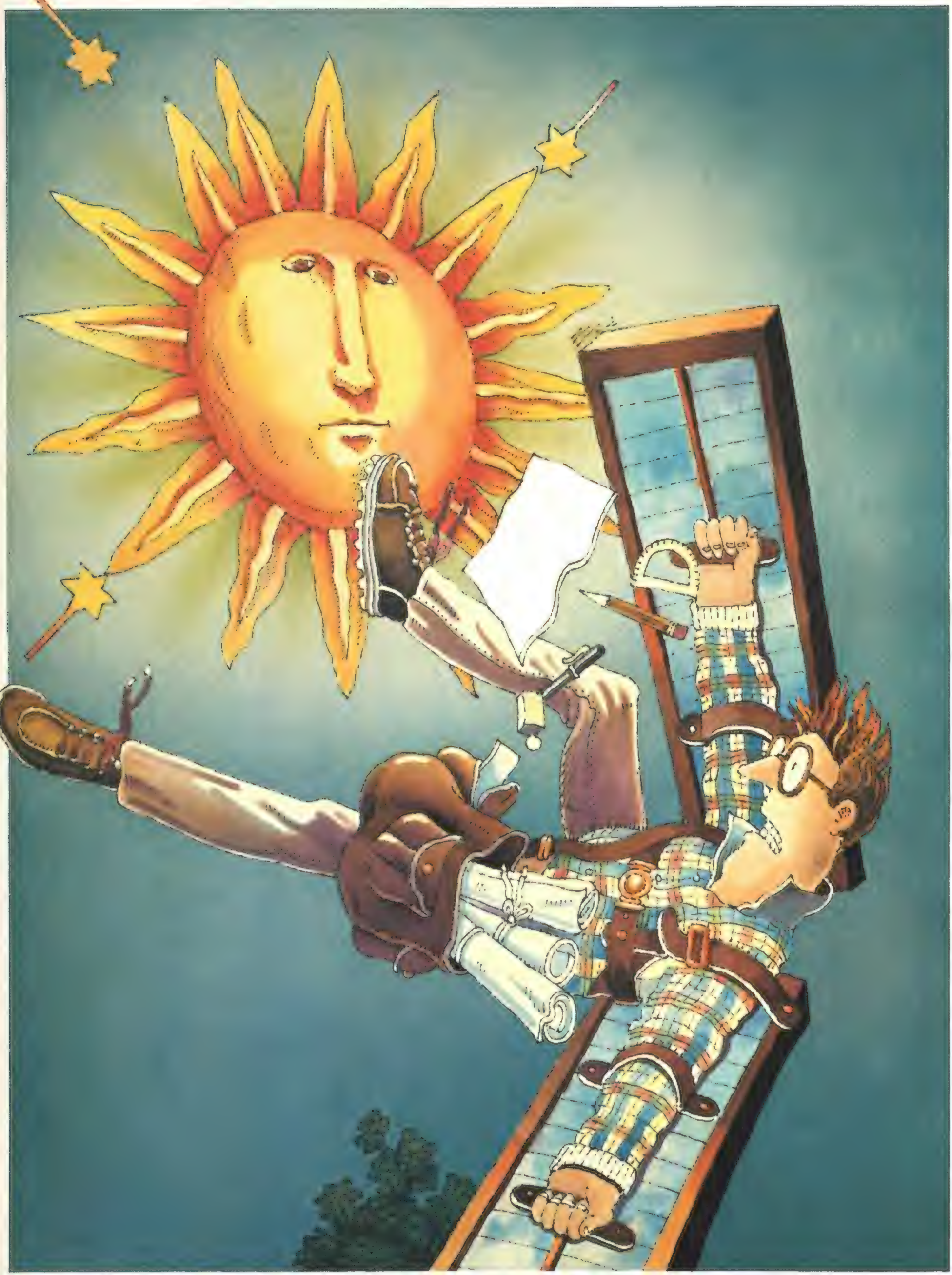
6. Color film cartridge. Brown

9. Reusable fabric cartridge.

7. Color film cartridge. Blue.

8. Color film cartridge. Green.

Smith-Corona



By Les Daly

A latter-day Icarus tries to build his solar dream house

With towel in hand, a new pilgrim searches for the secrets of a "free" hot shower. When his odyssey ends, he settles for a tan

Call me Icarus.

All I wanted was to escape from the utility companies. Solar energy would do it, the sirens sang. Solar, the eternal energy: heat your water, grow a garden, get a tan, all at once, and say goodbye to the gas company. So I tried.

But the closer I came to solar, the faster the illusions melted. I have plummeted back to the new inevitables: death, taxes and higher monthly bills for a warm house and a hot shower. Somehow an energy source that has been working since time began is an energy source whose time has not yet come, at least for an existing house. Someday, Icarus, but it's going to take a little more work.

Solar energy, as my mythological namesake discovered before me, is not an easy thing to approach. It is not even an easy thing to define, I discovered during a year's sojourn at the Department of Energy. The government insists solar is all kinds of things, including Niagara Falls, photovoltaics, wood, corn, manure and trash called urban waste. All I wanted was to retrofit my house with one of those modest gadgets on the roof that heats your water as long as it's sunny, and maybe a greenhouse to grow a few geraniums in the winter while wafting some free sun-warmed air into the living room, with all of it put together in kind of a quiet unobtrusive way that wouldn't make the place look like a spaceship.

A solar-powered Icarus plummets to Earth, singed in his quest for freedom from the utility companies.

Illustrations by Cameron Gerlach

But solar isn't like energy from oil or coal or natural gas, which are offered to us by giant corporations so big they can confidently do battle with the very Earth we're floating on and drill, dig, gouge, crush, pump and burn it with impunity and deliver the results to the door with reasonable certainty. Your bath, made possible by a grant from . . .

Bringing solar into your home makes all that look easy. Solar is still very often a strange mixture of the natural and unnatural, a sort of nationwide energy "experience" as they might say in California, shared in by engineers and economists, entrepreneurs and eccentrics, tinkerers and technocrats, businessmen and bureaucrats. Each is concocting or capitalizing on a peculiar blend of solar spiritualism and mechanical innovation, an awkward liaison as predictably uncomfortable as Bach played on a Moog synthesizer. Or, since truth is stranger, *You Are My Sunshine* played by a solar-powered music box sitting on Buie Seawell's windowsill.

Buie Seawell is the kind of fellow you look for as a guide when you begin a solar odyssey, because he has been there. He is a lawyer, but he has a sense of humor and he can enjoy the irony of serving three years as head of Colorado's Office of Energy Conservation and still needing two-and-a-half years of work and worry to get a solar greenhouse and hot-water system designed, built, installed and working in his home.

Someone else would have quit

"If I look back and think 'What if I wasn't who I was, knowing what I know about solar and still trying to put something on my house that really works,' I would have quit," he confesses. "Within 90 days it would have been too much."

Seawell, now legislative liaison for Colorado Governor Richard Lamm, is a solar advocate, he reassured me. He believes strongly that solar will eventually find its way into the American home, either by design in new homes or, more important, through additions to existing homes.

His towering two-story greenhouse looks like his personal chapel, a statement of his solar beliefs, as he stands in the sun beneath the high, sloping glass roof. He recalls the determination and effort it took to build it, and his soft North Carolina accent alternates between amazement and amusement; an indomitable Job played by Andy Griffith.

"We had to find architects at reasonable cost who knew something about solar," he explains. "It turned out they were still learning and I was the guinea pig.

A towering two-story greenhouse is one man's personal chapel to his belief in the future of solar power.

They brought in an engineer. He didn't know a lot about solar, but worried about heat loss and started oversizing the furnace. Other engineers wanted to put an entire active solar-heating system on the roof. But this house is 78 years old and we would have needed a whole new roof.

"We went round and round for a year before we figured it out. It took three weeks just to explain to the Denver building inspectors that solar collectors aren't like TV roof antennas. They sit still, they do not move and they don't need three feet of clearance. But the inspectors didn't have solar collectors in their city manual.

"In the meantime, the solar installers were cutting corners on the plumbing, I guess. When I went down in my basement to look at my new hot-water system it was leaking everywhere, like a German U-boat going down in a World War II movie."

Seawell's office, he confided, had prepared a booklet for Colorado consumers considering solar systems.

"I had that list of contractors, I had inside information. And I like solar. And after two-and-a-half years and $55,000, I'm ready to go," he exclaims, with a laugh blending equal parts of exhilaration and of exasperation.

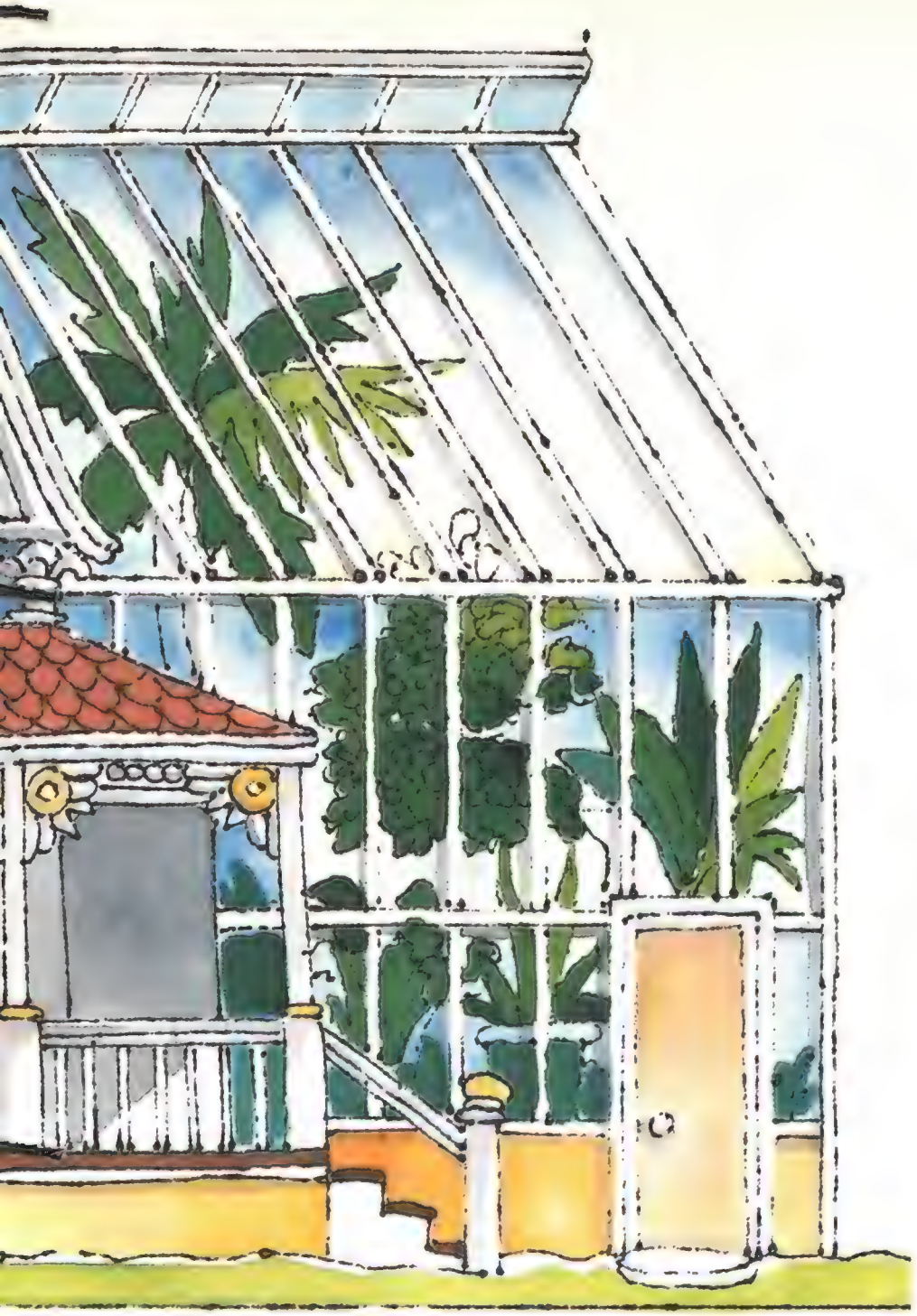
"But what is Joe Six-Pack going to do? He wants hot water and a warm home and no hassle, and he doesn't care about being part of a movement. He is probably going to give up."

No, he's not, Icarus Joe Six-Pack promised, though admittedly a little shaken. Seawell's system, after all, was working and had cut his gas consumption 30 percent, although his $55,000 investment, he figures, raised the value of his home by no more than $30,000.

"Remember," Seawell said gravely as I left his chapel, "the plumber is the key. To hell with the long-haired solar folks."

The solar movement acquired its "long-haired" counterculture image on Sun Day, a sort of solar Stonehenge ceremony on May 3, 1978, in which a nationwide outpouring of solar commitment was followed by waiting for something to happen. Nothing much did. The long-haired solar folks are mixed in with the well-coiffed rich, and together there aren't enough of them to give the sun much of a place in America's residential energy mix. The "backpackers," as some call them, for the most part build greenhouses—principally, they confide, because they like plants. The rich, on the other hand, add solar heaters for their swimming pools. Out of some 80 million homes in America today, there are only about

Les Daly spent 15 months at the Department of of Energy, wrote on the reopening of California's gold mines in SMITHSONIAN *in February 1980.*



235,000 solar installations. About one-third of them are heating pools.

One energy-involved family in Houston's swank River Oaks section investigated every conceivable form of solar energy that might be retrofitted to their home before concluding reluctantly that nothing was practical right now, except maybe a solar heater for the pool.

"It would be nice, but not much of an energy saving because we don't heat the pool now," they said.

Residential designer Roger Rasbach, who wrestled with that problem and others like it, says that American homes, as a rule, were carelessly built and trying to make them energy efficient with retrofitting is "like trying to take an old gas guzzler and make it as efficient as today's economy models." This could lead to the conclusion that the best way to beat the utility problem is to sell your present house and design a new one with all the solar features, particularly passive solar design, built in, which happens to be precisely what Rasbach had in mind. Passive solar design makes the sun work for you: south-facing siting, plenty of windows on the south side and few, if any, on the north, roof overhang for summer shading that still allows the low winter sun to shine in, and the house wrapped in plentiful insulation.

"For an extra three percent in the initial cost of the new home," he said, "you can use passive solar design to get maximum energy efficiency. The savings over the life of the mortgage will equal the original cost of the house."

A question of retrofitting

Rasbach, and other architects like Salt Lake City's young Terry Tresder, make the point convincingly that "there is no excuse today to build a new house that doesn't have passive solar." But 80 percent of the homes Americans will be living in at the turn of the century are already built, and already running up heating bills. Aside from the economic difficulty of building a new home to cut energy costs, unfortunately not all architects and builders are skillful in dealing with solar.

Betty Rubin, whose dazzling modern home overlooks Salt Lake City and the Wasatch Range, agrees: "There has got to be a future using sunshine . . . but we're far from it in my house."

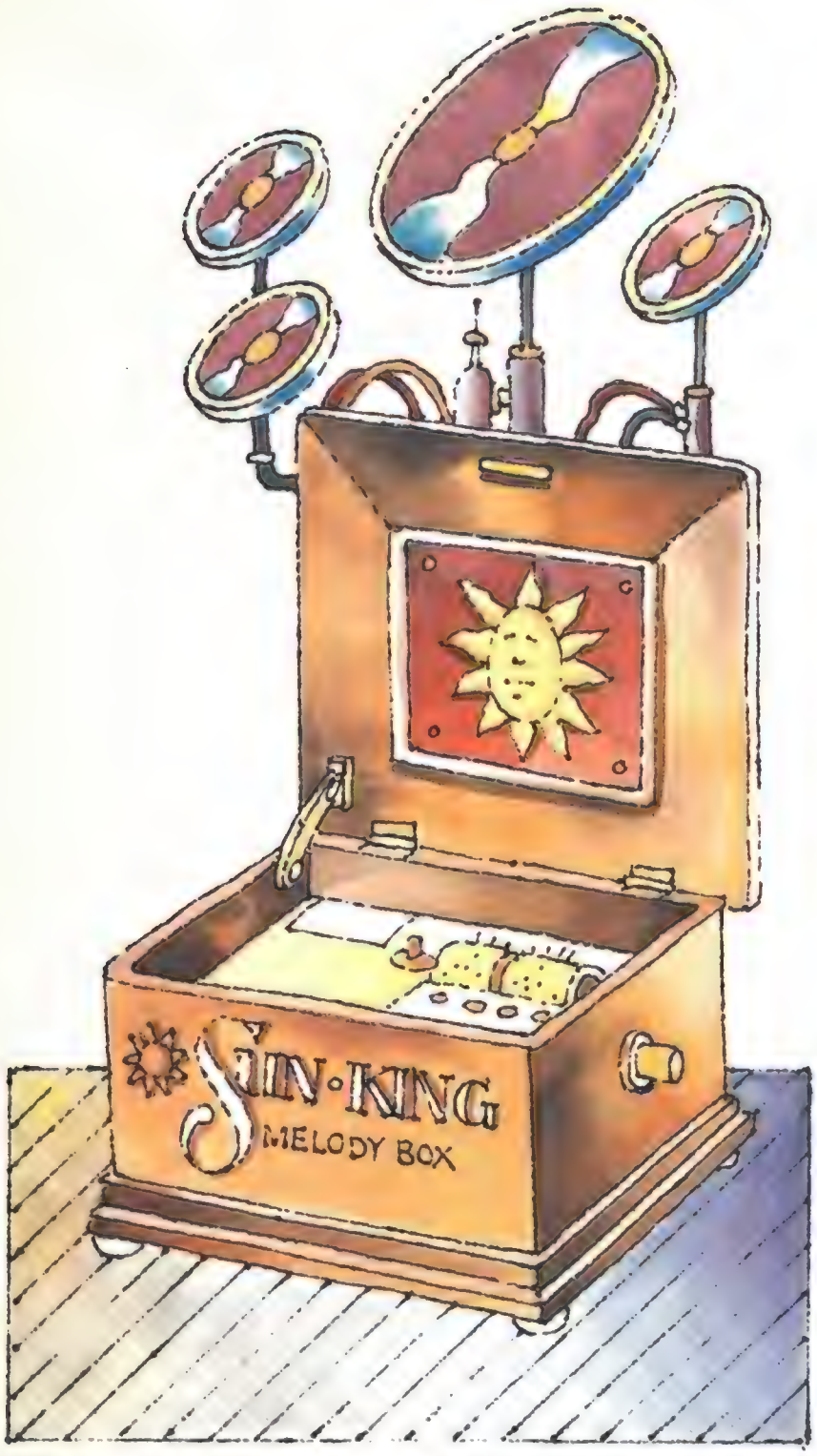
The Rubins have 39 solar panels on the roof, a 2,000-gallon storage tank in the basement ("the world's largest hot tub," she says), $22,717 in the mortgage for their solar systems and "not enough hot water to count on for the heating system."

She says the builders promised them 80 to 90 percent efficiency. But the system is plagued by gremlins, the builders say they can't fix it, and their informal calculations show it will take "50 to 60 years" to get out their investment. The folks from the Utah Energy Office, who are anxious to popularize alternative energy activity such as solar, come out regularly to monitor the Rubins' erratic progress on the array of ten meters that line their garage wall, which looks something like the engine room of the ship that sank Seawell's U-boat. They say they can't understand the inefficiency any better than Mrs. Rubin can.

"The industry is a big problem," remarks Maggie Wilde of the State staff, as she listens to Mrs. Rubin wondering where have all the showers gone. "There are a lot of crackpots and hard-sell salesmen selling '100 percent efficient' systems, turned out by small companies that oversell and underproduce."

The solar industry is plagued by that problem and the plague seems to be getting worse. *Forbes* magazine

Frustration and the solar dream



The sun sings its own praises with a solar-powered music box that plays *You Are My Sunshine.*

pointed out in a recent survey it titled "Solar eclipse" that nine of the ten leading manufacturers in the country lost money last year in their solar-collector business, a difficult position from which to establish customer confidence.

"People want to be sure that someone is going to stand behind the system and service it with no questions asked," noted Mark Braly, energy coordinator for the City of Los Angeles, and a solar advocate for ten years. "A lot of us were a little romantic about small businesses and we thought solar was something they could do instead of the oil companies or the big utilities," Braly recalled. "The trouble with anyone entering a new field is that an awful lot of the time they don't know what the hell they're doing."

Braly speaks from experience, and the experience is not very much different from that of his Colorado colleague Buie Seawell. He installed a solar hot-water system on his Los Angeles home. "I would do it again," he says, encouragingly. "But would I do it again if I weren't the city energy coordinator who is associated with promoting solar energy?" he asked himself. "The answer is: probably."

Solar advocacy is not a simple thing to follow. Braly had most of the problems Seawell had and a few more. Roof tiles ("as delicate as archaeological potsherds") were shattered when the roof-top collectors were being installed and the roof leaked; trees had to be cut back when they shaded the collectors from the low winter sun; controls worked better on cloudy days than they did in sunshine; and the installer said the guarantee was fulfilled because the water hit 109 degrees F once. As a consequence, Braly said he has lost some of the romanticism he felt about the solar industry.

"Putting a solar hot-water system in your home is a hell of an undertaking, and who is going to do it other than someone who is as highly motivated as I am?"

A case of caveat emptor

Most of the states, including California, have published lists of manufacturers and installers. Sometimes these are restricted to bonded organizations, as in California; others are just lists. The activist Delaware Energy Office, for example, lists only certified installers who have taken a training course run by the state and the vocational high schools.

"But still," warned Deborah Doelze, an energy source of her own who scoots around the state telling homeowners, businessmen, fishermen and even prison inmates how to save energy, "someone who wants a solar system has to do comparison shopping, get at least three estimates, check references, do research, read *Consumer Reports*, find out if the firm has ever been ordered to cease and desist."

11:23 P.M.

MONTE CARLO. The casino hopes you never grace their tables again. The restaurant was only too pleased to greet you to theirs. Now, it's coffee laced with Grand Marnier, sipped through cream. Sometimes you win. And sometimes you win.

What time today will you say "Grand Marnier"?

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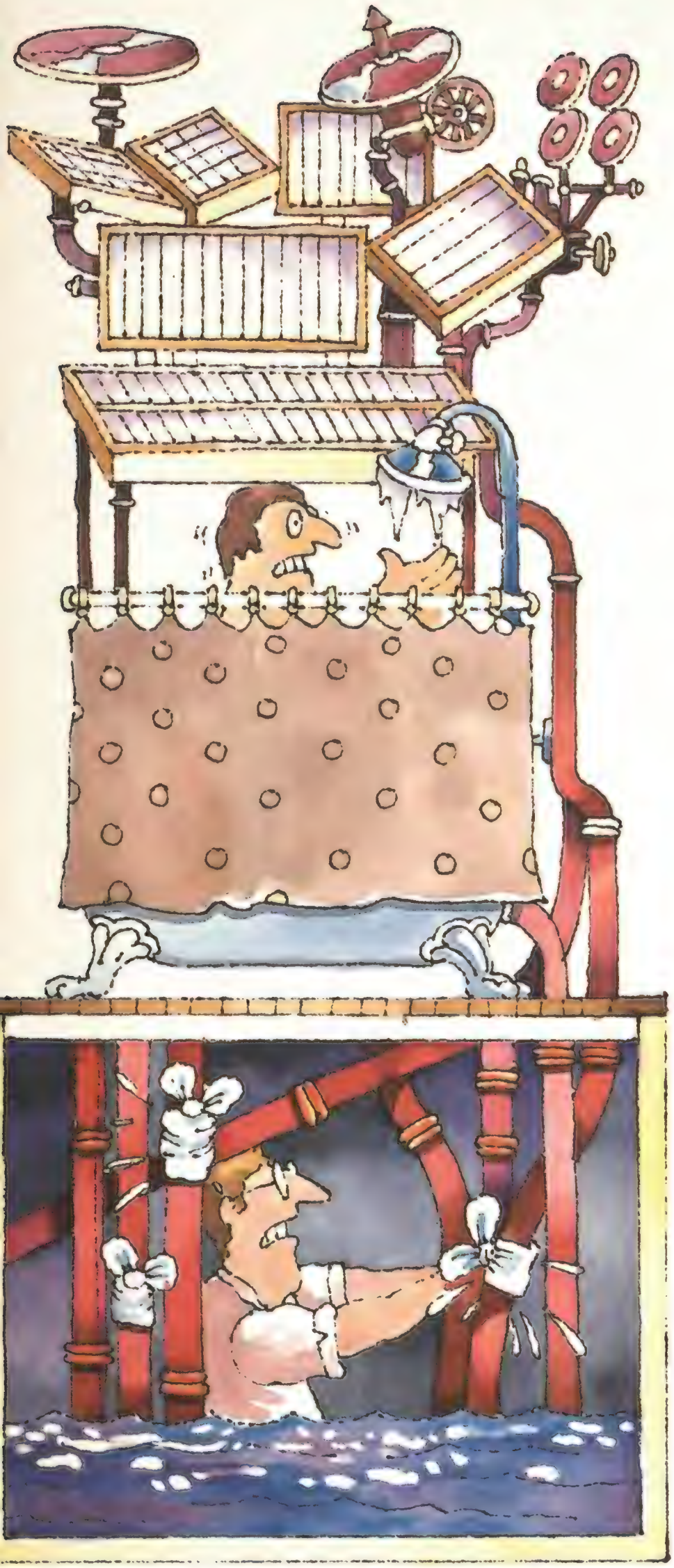

Arrays on the roof don't always mean hot water in the shower, but can mean floods in the basement.

That is what is known in solar circles as the "hassle factor." What about just looking in the Yellow Pages and having a unit sent over? I tried that, too.

The biggest advertisement on the page, featuring an orange sun and the slogan "Step into Tomorrow . . . Today" led to a company that apparently had stepped out of business yesterday. A tape-recorded message said the phone had been disconnected.

The next advertisement turned up a friendly fellow who offered everything but information on how many units his company had installed previously. He never called back.

A third attempt to follow an orange sun on a yellow page brought me, curiously, to a basement office with no sign. Inside a gray-haired man dressed in sweat shirt, jeans and sneakers said he was a solar specialist . . . and also conducted business as a rental agent for people seeking roommates.

An installer yet to install a system

He complained about "government and consumer guys" who warned against dealing with "anybody who hasn't been in the business five years." His concern was understandable, since he had been in the business only three years, he said, and had yet to install a system on his own, although he said he had a "working relationship" with a man who had been at it four years and "has probably installed 150, although there really is no telling. . . ."

As I contemplated a potential $3,000 investment, and remembered Deborah Doelze's safety checklist, he told me of his solar background. "I had to go to work —everybody's got to do something," he said. "I looked into solar and thought here's an opportunity, a way to make a living.

"People who are solar advocates," he continued expansively, "are pseudohippies. I don't think they can sell solar. That's why I am in the business."

It was becoming clear that retrofitting an existing home with a solar-heating system was a more ambitious project than I had realized, like trying to fly with feathers and wax. You can take on plumbers, inspectors, architects, broken tiles, leaky roofs, shade-throwing trees, checklists, cease and desist orders; or you can call up a department store and get a new gas-heated tank, connected tomorrow, with a ten-year guarantee. I wondered if solar would make me a pseudohippie or part of the poolside rich, when all I wanted was a hot bath at a cut rate. A recent Gallup Poll of homeowners found that about half of the people surveyed thought solar-energy systems are owned by "economy-minded, scientific and upper-income" folk, and only ten percent said solar owners are "not very different from my friends."

It takes a generation to grow a pencil.

That's why the time to grow the next generation's wood and paper products is today, which is exactly what we're doing at Boise Cascade.

Today, we'll plant up to six seedlings for every tree we harvest, and we'll nurture and protect them until they come of age…so there'll be *more* tomorrow.

Today, we'll explore new growing and manufacturing methods that promise more trees per acre and more wood and paper per tree.

Today, we'll use our logging and manufacturing by-products to make useful things like chunk bark for gardens and particleboard for furniture.

And we'll burn much of what's left over for energy.

We aim to supply the next generation all the Boise Cascade wood and paper products they'll ever need…and the one after that… and the one after that…

Wood and paper products are our life's blood, and we plan to live a long time.

Boise Cascade Corporation
Wood and paper for today, trees for tomorrow.

Sun Day, a sort of solar Stonehenge ceremony, gave solar power a long-haired, counterculture image.

There is only one person, I thought, who can sort all this out and provide a light at the end of the odyssey: Denis Hayes. Denis Hayes created Earth Day in 1970 and he created Sun Day in 1978; he may be the closest thing to a solar deity we have. When I talked to him last spring, he was director of the Solar Energy Research Institute, which he has since left.

There I stood, in the Institute offices in Golden, Colorado, towel in hand, so to speak, hoping Hayes would solve my solar hot-water problem, that he would sweep aside the anxieties caused by Seawell and Braly and Rubin and the rest.

Hayes was dressed in a dark blue pinstripe suit. His office, decorated with modern art and louvered blinds, was a match for any Madison Avenue executive's. No pseudohippie, he. I felt better already.

He said, "With an aggressive program, America may retrofit five to eight percent of its houses a year . . . but we are going to have a lot of problems." He made it clear he did not think an aggressive solar retrofit program was in the national forecast.

"We've got to get to the builders of new houses and new commercial buildings," he declared instead. "One- and two-story commercial structures are the largest single leverage point in the system.

"We need," he added "enough builders to get a critical mass." The creator of Sun Day described the future of solar energy in a nuclear metaphor!

I asked again about solar hot-water heating.

"If you can get your warranties lined up and your financing lined up and something that comes out in *Consumer Reports* says a certain product seems to work reasonably well, then I think you've got it," he replied.

Consumer Reports had already said "solar hot-water systems are feasible from a technological point of view, but homeowners do not yet have adequate assurance that the systems they buy will be dependable or durable, or properly installed and maintained. They do not have an adequate way to compare the cost, saving and performance of one brand against another." Other techniques, such as flow restrictors and insulation on an existing water heater, the magazine reported, would save many people more than a solar hot-water system.

According to the most recently available statistics, Americans are of two minds about things solar; nationally, we spend about as much on home solar-energy systems as we do on suntan lotions. I decided for now to get a tan.

A new house can be designed for passive solar—but how do you retrofit your nice old Victorian?

By Charles Lockwood

Stars' mansions provided real sets for fantasy lives

Extravagant palaces built in the Twenties by the kings and queens of the screen enhanced their images and cost them plenty

The origins of the motion picture industry in Los Angeles were anything but grand. In 1912 Mack Sennett helped convert the old Edendale market near Glendale into the offices of Keystone Studios. Cecil B. DeMille and the Jesse L. Lasky Feature Play Company filmed their first Western feature, *The Squaw Man* (1914), at a faded yellow barn in what was then the outlying village of Hollywood. And D. W. Griffith's studio while he was making films with the Biograph Company in about 1910 was a former streetcar storage yard near downtown Los Angeles.

Most leading movie people, likewise, lived quite modestly then, because they did not know how long the fledgling motion picture industry and their high salaries were going to last. In the mid-teens, Charlie Chaplin took a small room at the Los Angeles Athletic Club, even though he was already famous as the beloved little tramp. Cecil B. DeMille and his family rented a $30-a-month cabin in the then-rural Hollywood Hills while he directed *The Squaw Man*. When Lillian Gish played Northern girl Elsie Stoneman in *The Birth of a Nation*, she lived in a five-room apartment in downtown Los Angeles with her mother and sister Dorothy, "because it was cheap, and I could ride the trolley back and forth to the studio."

Tom Mix, a cowboy on the screen and off, filled living room with magpie assortment of memorabilia.

But the days when top movie people rented single rooms and small apartments, or even took the trolley to work, were fast disappearing by 1920. The movies had become America's leading mass entertainment, and dozens of film companies built sprawling studios throughout Los Angeles. At the same time, stars, producers and directors started to settle down and to spend some of their money on clothes and jewelry, on automobiles, on parties and on that foremost American status symbol: the home.

Some 1920s stars rented or bought large, though otherwise unexceptional, homes that looked as if they belonged to successful Los Angeles businessmen. But other stars had much grander ambitions about their life-styles and their images. Reveling in their $5,000 and $10,000 weekly salaries, these silent-screen idols bought five-, ten-, even 20-acre estates in the Hollywood Hills or in Beverly Hills and then built enormous mansions that were more than just places to live, or proof of their wealth.

Lavishly designed, frightfully expensive and carefully thought out, these "dream palaces" were stage sets where many leading actors and actresses played out their well-publicized private-life "roles" for millions of fans. These estates, moreover, were both costly playthings and walled compounds where the stars could escape the relentless glare of publicity and could be themselves. Quite often, the actual, behind-the-scenes lives of the 1920s stars were more extravagant, more fantastic, than their manufactured images in the studio press releases.

At home at Pickfair

The first dream palace was Pickfair, the 16-room mansion that Douglas Fairbanks created out of a hunting lodge on Summit Drive in Beverly Hills, not too long before his March 1920 marriage to Mary Pickford. Handsome, energetic and athletic, Fairbanks had become a star playing the clean-living young American male in satirical comedies during the late teens, then switched to his still-remembered swashbuckling roles in movies like *The Three Musketeers* (1921), *Robin Hood* (1922) and *The Thief of Bagdad* (1923). Mary Pickford, with her angelic face and her famous golden curls, which she reportedly brushed 200 times every night and rolled up in kidskin, was the immensely popular Little Mary, "America's Sweetheart," who usually portrayed appealing adolescent girls from 1909 until the mid-1920s, when she was over 30.

With its ever-so-proper Tudor-style facade, Pickfair looked more like the home of a cultivated well-to-do country gentleman and his lady than the showplace of two former stage actors who were reportedly earning about a million dollars a year *each* in the movies. The

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Douglas Fairbanks and Mary Pickford hired gardeners to landscape the grounds of their Pickfair estate, but they did their own planting for this publicity shot.

first floor consisted of a large entrance hall, a living room, a dining room, a breakfast room, a kitchen and servants' quarters, plus the all-important private screening facility where Douglas Fairbanks and Mary Pickford watched several movies a week, often their own. Upstairs on the second floor were Doug's light brown bedroom, Mary's pink and pale green bedroom and several guest rooms. The third floor consisted of a bowling alley and billiard room.

While Mary Pickford furnished the house in costly reproduction Jacobean-style furniture from Los Angeles department stores, plus Oriental rugs and a few genuine antiques, Fairbanks transformed Pickfair's dusty and chaparral-covered grounds into a landscaped pleasance where he could enjoy his favorite sports and entertain his friends without ever leaving home. Rather than drive over about six miles of rutted dirt roads to the Pacific Ocean for a swim, he brought the Pacific Ocean to Pickfair, or at least a scaled-down version: a 55-by-100-foot swimming pool with a sandy beach along one side. Because Fairbanks liked canoeing, he dug a series of small canoe ponds along one hillside. And in the canyon below the house, he built stables so that he and Mary could ride their own horses around the property or up into the then-barren nearby mountains.

As part of Pickfair's extensive landscaping, the Beverly Hills Nursery started planting several hundred trees and shrubs around the house at the end of 1919. But when this project was still unfinished a year later, Fairbanks admonished Raymond Page, the nursery's landscape architect:

Charles Lockwood adapted this article from his new book Dream Palaces: Hollywood At Home *to be published by The Viking Press in October.*

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"Ray, this work is going too slowly," Fairbanks reportedly complained.

"What should we do, Mr. Fairbanks?" Page replied.

"Well, I've got an idea," Fairbanks said. "Let's move in some lights from the studio and hire men to work three eight-hour shifts."

"That's exactly what we did," Page remembered recently. "Although the landscaping did get done, every time I went up to the house late at night to check on the progress, I'd find half the workmen asleep under the bushes."

Within a few years, other stars' dream palaces would be architecturally more distinguished, more expensive, and even much larger than Pickfair. But no other star's home ever claimed the same feverish public attention year after year. More Americans, for instance, probably cared about what happened at Pickfair than at Warren G. Harding's or Calvin Coolidge's White House, because Douglas Fairbanks and Mary Pickford were two of Hollywood's biggest and most enduring stars. They were so popular, and so frequently written up in newspapers and in fan magazines, thanks to their publicity staff, that millions of fans spoke of them simply as "Doug" and "Mary," as if they were good friends.

A large part of Pickfair's mystique came from Douglas Fairbanks' and Mary Pickford's frequent entertaining. On weekdays when she and Doug were making pictures, Mary often invited her mother, Charlotte, childhood friend Lillian Gish, or screenwriter Frances Marion for dinner, which was invariably followed by a movie. And Douglas—that's what Mary called him—dragged so many co-workers and friends home from the studio on the spur of the moment that she instructed the staff to set the table for 15 every night. "Imagine my surprise," Mary once said, "when I came to dinner and saw three stock-car drivers and a bunch of dirty cowpunchers sitting around the table."

On weekends, Douglas Fairbanks and Mary Pickford hosted formal dinner parties, again followed by a movie, for other Hollywood stars and national celebrities, at various times including Jack Dempsey, Albert Einstein, Amelia Earhart, F. Scott Fitzgerald, Henry Ford, Walter Johnson, Babe Ruth and H. G. Wells. To loosen up these occasions, Doug sometimes crawled under the table in his dinner jacket and grabbed at—even bit—a guest's well-turned ankle. Or he mischievously insisted that someone sit down in a chair that had been wired to give a mild electric shock. Or he set one place at the table with a flexible fork or a dribble glass.

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Mary paddles as Doug takes it easy in canoe in their 55-by-100-foot swimming pool. There was sand on one side to save them the six-mile drive to the beach.

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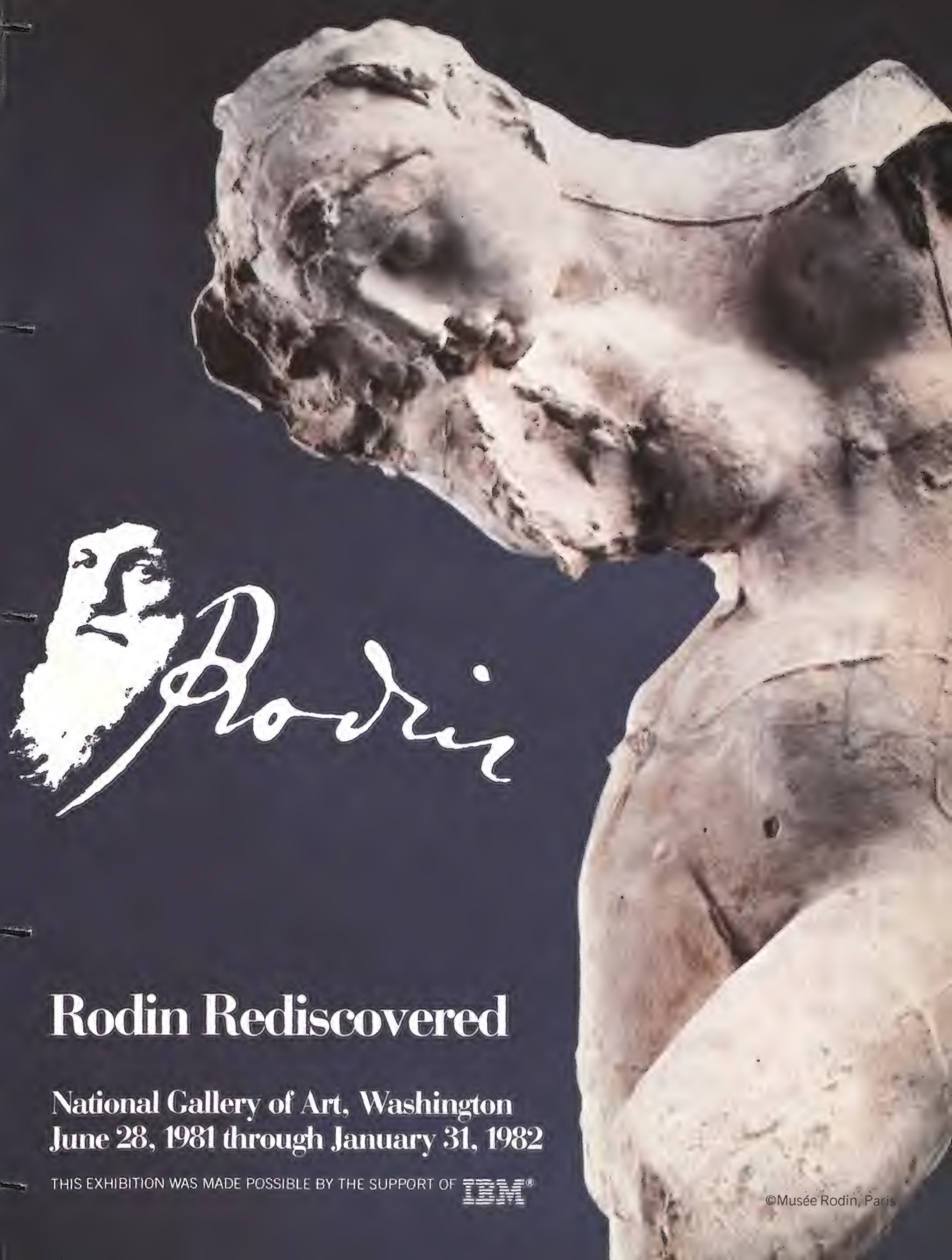
star-struck readers that "One can cut no end of a dash by having been a guest of Mary and Doug," many of their guests were bored by the endless talk about the movies at the dinner table. Others felt something was missing from the meal itself.

"We'd go there all dressed up," remembered actress Miriam Cooper, a frequent visitor at Pickfair, "and sit down at this huge table with the lovely china and servants falling all over themselves serving you, and not even get one lousy drop of wine." Douglas Fairbanks apparently had a phobia about alcohol. He did not serve any liquor at Pickfair, not even beer or wine, during the early 1920s. Of course, Prohibition was then in effect.

In 1923 Douglas Fairbanks and Mary Pickford entertained their first titled guest, Alfonso XIII, then the king of Spain, and according to screenwriter and frequent Pickfair guest Anita Loos, "Doug was never the same again." The country-gentleman look that Fairbanks had favored at Pickfair only a few years earlier no longer seemed appropriate for such exalted personages or, for that matter, for the "King and Queen of Hollywood," as some newspapers and magazines now described them.

Doug banished the Jacobean-style furniture to their Santa Monica beach house and redecorated the living room and dining room at Pickfair in the more formal 18th-century French style, once again buying expensive reproductions rather than antiques. To dress up the dining room even more, he splurged on a gold dinner service, crystal placecard holders and, later, a set of china that Napoleon had given Josephine. Now the housemen served weak mixed drinks —no more than two per guest—and some wine during the meal.

Having created the perfect stage-set home with their movie millions and with the help of Albert, the tireless majordomo, Douglas Fairbanks and Mary Pickford proceeded to entertain much of the world's remaining nobil-



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ity for dinner or a several nights' stay, including Prince George, youngest son of King George V of England, the King and Queen of Siam, the Crown Prince of Japan, the Crown Princess of Prussia, and Lord and Lady Mountbatten, who thoughtfully left two framed photographs inscribed "To Doug and Mary, from Edwina and Dickie." Thereafter, these trophies occupied a place of honor on a small French-style table in one corner of the living room.

Fairbanks' passion for nobility became so well known that Hollywood wits began to tell the following story: Question: "Why does Doug go to Europe each year?" Answer: "To book his royal visitors for the coming year."

Even Fairbanks' good friend, Charlie Chaplin, couldn't resist kidding him a little. One day Chaplin came up to Doug and reportedly said:

"Hello, Doug. How's the duke?"

"What duke?" asked Fairbanks.

"Oh . . . any duke," Chaplin replied.

Douglas Fairbanks' and Mary Pickford's hobnobbing with royalty, however, never hurt their popularity with their millions of loyal fans. The American public, if anything, was delighted that world nobility sought out their "Doug" and "Mary," who were at the same time very much cultivating the common touch. Their publicity staff described what Doug gave Mary for her birthday, how Mary rearranged the living-room furniture, even their pet names for each other. Douglas was "Tiller," Mary was "Hipper."

The press and the public bought this image: "Offscreen Mary Pickford contents herself with being Mrs. Douglas Fairbanks," reported the *Ladies' Home Journal*. "She is the 'little woman' whose sole concern is her husband's happiness." The *Journal* neglected to mention that Mary had 14 full-time servants to help her achieve this state of domestic bliss.

Once Douglas Fairbanks and Mary Pickford had created the movie colony's first dream palace at Pickfair, other stars quickly followed their lead and bought or built their own lavish and highly personal stage-set homes. One of the first was Gloria Swanson, the star of sophisticated and naughty Cecil B. DeMille comedies like *Male and Female* (1919) and *Why Change Your Wife?* (1920). In about 1923 she bought the two-story Italian Renaissance-inspired mansion built by razor-blade millionaire King C. Gillette, which stood in the midst of some four acres of sweeping lawns and full-grown palms and acacias, at 904 North Crescent Drive in Beverly Hills, opposite the main entrance to the Beverly Hills Hotel.

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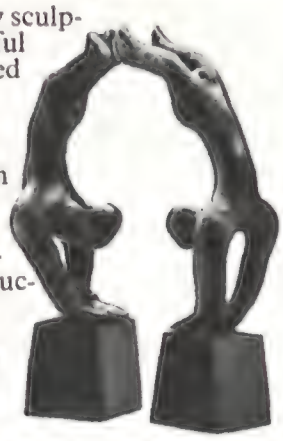

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Charlie Chaplin built his home with help of studio carpenters used to constructing temporary sets. To Chaplin's chagrin, friends called it "Breakaway House."

ception room in peacock silk, hung tapestries and paintings on the walls of the elegantly furnished living and dining rooms, decorated the breakfast room in cream and gold, turned one room into an intimate movie theater and installed a black marble bathroom with a golden tub next to her bedroom. Her bed was a gondola that she brought back from Europe.

But a Beverly Hills mansion, no matter how richly furnished, could be nothing more than a backdrop for this stylish actress, who once proclaimed: "I have decided that while I am a star, I will be every inch and every moment a star."

So Gloria showed the rest of the stars. She hired four butlers for her Beverly Hills mansion and staged dinner parties with a liveried footman stationed behind each guest's chair. She bought three Rolls-Royces, one white, one maroon, one black, and her two chauffeurs wore matching uniforms. For less formal occasions, she drove her own leopard-skin upholstered Lancia sports car.

"In those days the public wanted us to live like kings and queens," she was once quoted as saying. "So we did—and why not? We were in love with life. We were making more money than we ever dreamed existed and there was no reason to believe that it would ever stop."

Her greatest coup, however, was her 1925 marriage to her third husband, Henri, the handsome and gallant Marquis de la Falaise de la Coudraye, whom she met while making *Madame Sans-Gêne* (1925) in France. This was the first marriage between Hollywood "royalty" and authentic European nobility, and when she returned to Beverly Hills with her new husband she could smile at Douglas Fairbanks' and Mary Pickford's search for titled guests because *she* was a marquise.

She, moreover, was not intimidated by the grand Pickfair parties. One evening in 1928, Mary's guest of honor, Prince George of England, who later became King George VI, told Gloria that he hoped to see more than just Pickfair during his one-day visit to Los Angeles. That was all she needed to hear, and she devised a wonderful scheme. The prince left the party early and just outside the Pickfair gates met Gloria Swanson

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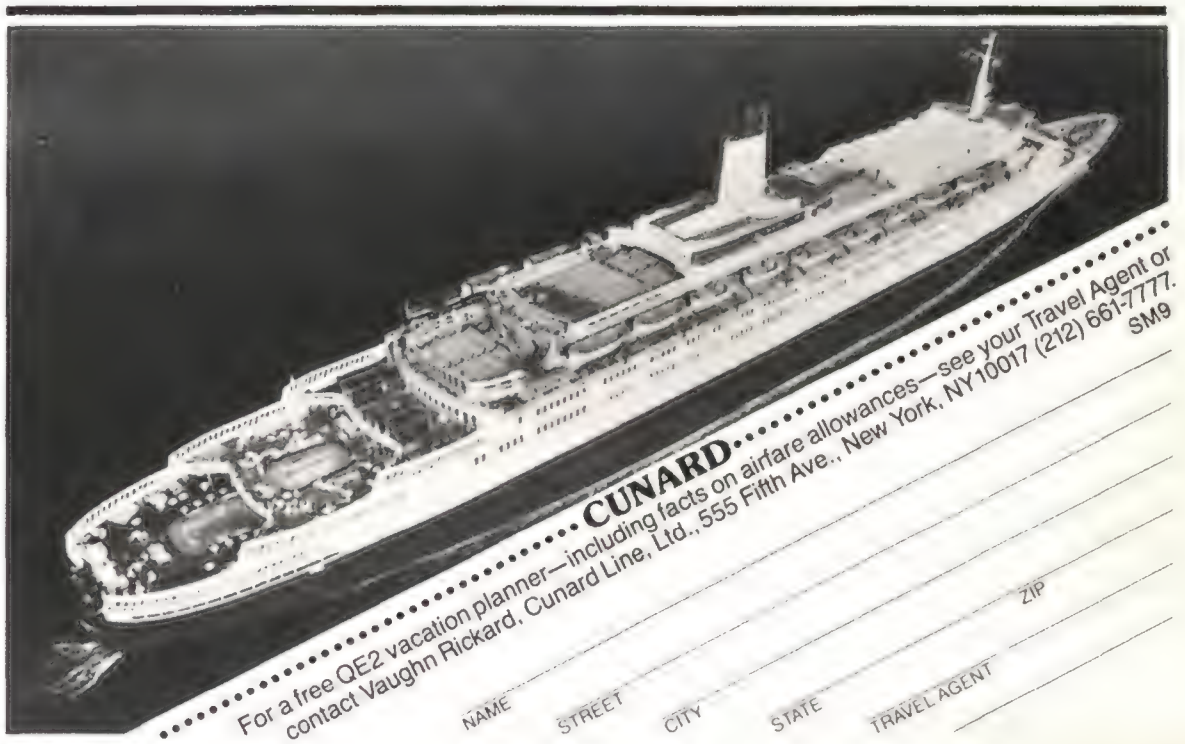

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and eight of her friends, including Charlie Chaplin. They had sneaked out the back door of the house one by one. In a string of cars, they headed for Fatty Arbuckle's nightclub in Venice, where they danced and sang until 3 A.M., then returned to the Swanson mansion where they ate breakfast and watched Chaplin perform "skits, in which he played all the parts, *and* all the instruments in the band," according to Miss Swanson in her autobiography years later. "I had made everyone promise never to tell Mary and Doug, but in vain. It was all in the papers the next day."

In 1923 Charlie Chaplin built his own dream palace at 1085 Summit Drive, next door to Pickfair. He was between his first and second marriages and, except for his staff, he moved into the two-story four-bedroom Spanish-style house alone. As a comedian, Chaplin did not have to project any particular image at home. But having been born in a London slum, then bounced in and out of gloomy orphanages and workhouses as a child, the grown-up Chaplin wanted his estate to reflect comfort, success and money, and it did, at least on first impression.

The living room, for instance, had

Mugging for camera are Charlie Chaplin (left), Mary Pickford, Douglas Fairbanks.

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paneled walls painted white, dove gray wall-to-wall carpeting, a large fireplace, a Steinway grand piano and built-in bookshelves filled with impressive-looking books.

In this stiff, essentially masculine room, Charlie Chaplin acted out the role of an English gentleman. He hung prints of London in the fog on the walls and burned coal, not wood, in the fireplace on chilly evenings. Whether he was alone or entertaining friends, Chaplin was quite fussy about having the coal arranged just right. Many evenings he took over the task from his Japanese butler, Frank, and reportedly spent ten minutes making a perfectly symmetrical pile of coal in the fireplace grate.

Despite its overstuffed furniture and cheery fires, the genteel look of Charlie Chaplin's home was no more real than a Hollywood set. During the first year after Chaplin moved in, the second floor was almost bare, except for a few rather motley pieces of furniture in his bedroom.

Charlie's house reflected his well-developed sense of economy in other ways as well. One day, director King Vidor was getting ready to take a shower in Charlie's bathroom when he noticed a short piece of pipe poking through the tile walls of the shower stall of the otherwise elaborate bathroom, instead of the usual spray attachment. When Vidor called out to ask Charlie "how a fellow succeeded in rinsing off the soap," Chaplin replied: "Cup your hands and splash the water over you."

On a later visit, Vidor saw a small pan in the shower. This was Chaplin's answer to guests who complained about the cup-your-hands method. Even though Charlie was a millionaire many times over, he apparently wasn't going to pay a plumber to come to the house and install a proper shower head.

Chaplin's greatest economy, however, was the house itself. To save money on its construction, he used his studio carpenters when they weren't

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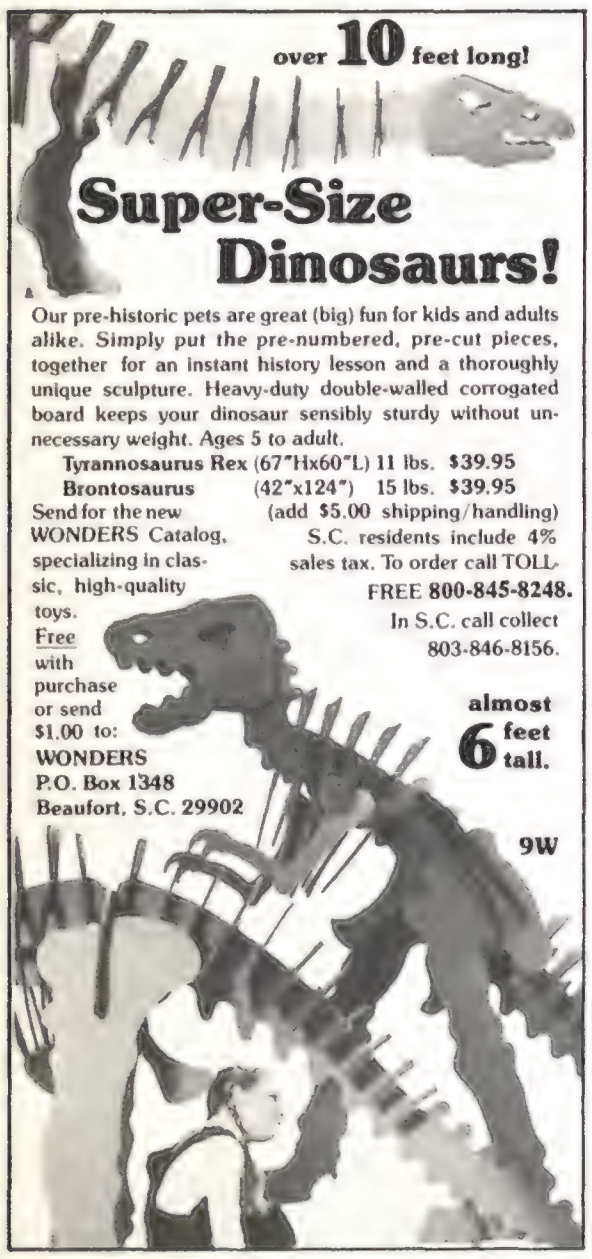

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busy making sets. This seemed like a sensible plan, but it turned out to be a mistake. His carpenters had become so accustomed to putting together temporary sets that they had forgotten how to build a permanent structure. No sooner had Chaplin moved into his new house than little things began to go wrong and fall apart. To Charlie's chagrin, his friends and neighbors began calling his Summit Drive dream palace "Breakaway House."

Just down the hill from Chaplin's house was cowboy Tom Mix's six-acre estate at 1018 Summit Drive. Protected by a wall along the road and surrounded by formal gardens, Mix's stucco mansion looked deceptively sedate from the outside—except for the large neon sign with his initials TM on the roof. That sign was only a clue to Mix's rather untutored architectural taste.

Extravagant, vulgar, sometimes intentionally comic, Tom Mix's house was designed to entertain in and to show off his wealth. In the dining room, an illuminated fountain sprayed water in a variety of colors. When Tom's favorite horse, Tony, died, he turned his tail into a bell-pull. Just as a cowboy brands his cattle, Mix, who had been a real-life cowboy before coming to Hollywood, put his initials almost anywhere he could find space: on the gates to the driveway, on the front door of the house, over every fireplace.

By 1925 Tom Mix was reportedly earning about $17,500 a week, and spending all of it. One room at his Summit Drive mansion was given over to his silver-studded saddle collection, and another held dozens of pairs of boots. Wearing one of his many Stetsons, Tom drove a white Rolls-Royce sedan or a white Packard convertible, the doors of each embossed with gold initials TM. Mix owned a 96-foot yacht, the *Miss Mix-It*, but preferred to spend his leisure time at his Arizona ranch. For Hollywood parties, Tom often wore a white

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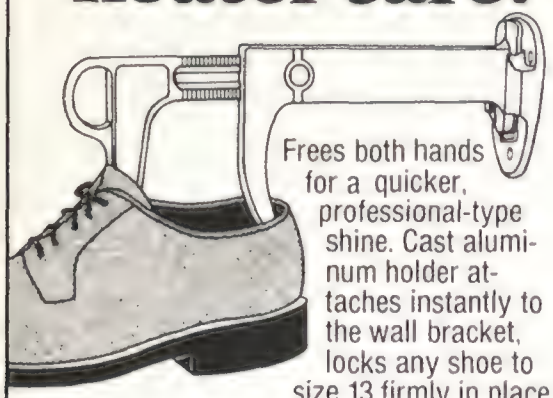

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Looking much like a French boudoir, this was master bedroom in Tom Mix's house. Mix obviously had left the decorating to Vicki, wife number four.

or purple tuxedo with matching boots and a Stetson, plus a blaze of diamond stickpins, rings and wristwatch. Sometimes he wore his cowboy garb, fancying it up with a pair of diamond-encrusted spurs and a diamond-and-platinum belt buckle.

Tom Mix was "just an ordinary cowboy," according to Anita Loos, but he did enjoy his fame and his money more spontaneously and more genuinely than many other stars who calculated their every move and every statement. When the movie cameras stopped rolling at the end of the day, Mix abandoned his wholesome never-drinking screen personality.

During one party at his Summit Drive home, Tom reportedly got roaring drunk and had a knock-down-and-drag-out fight in the finest Wild West tradition with cowboy actor Art Acord during which he rode his horse Tony up the main stairs to the second floor, hollering and firing his gun into the ceiling all the way.

With Douglas Fairbanks and Mary Pickford, Gloria Swanson, Charlie Chaplin and Tom Mix ensconced in their Beverly Hills dream palaces by the early 1920s, other stars, producers and directors moved into the once-sedate village of about 1,000 residents some ten miles west of downtown Los Angeles. The more notable among these included John Barrymore, Clara Bow, Marion Davies, Buster Keaton, Pola Negri, Will Rogers and Rudolph Valentino.

But rather than gaining privacy in Beverly Hills, the stars were pursued by fans who now found most of their idols in one place. Lovesick women climbed over the nine-foot concrete wall at Falcon Lair for a glimpse of Valentino. Even Douglas Fairbanks and Mary Pickford could not prevent the "rubberneck buses" from climbing Summit Drive for a quick peek at Pickfair or stop a hot-dog vendor from setting up his stand just outside the gate to feed the hungry faithful.

One of the last leading silent stars to move to Beverly Hills was Harold Lloyd, who had become one of America's favorite comedians, playing the role of a quiet, fumbling, but sympathetic character in films like *Grandma's Boy* (1922) and *Safety Last* (1923) —where he climbed up the side of a

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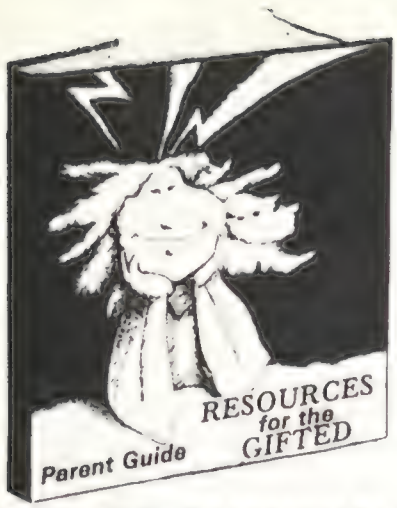

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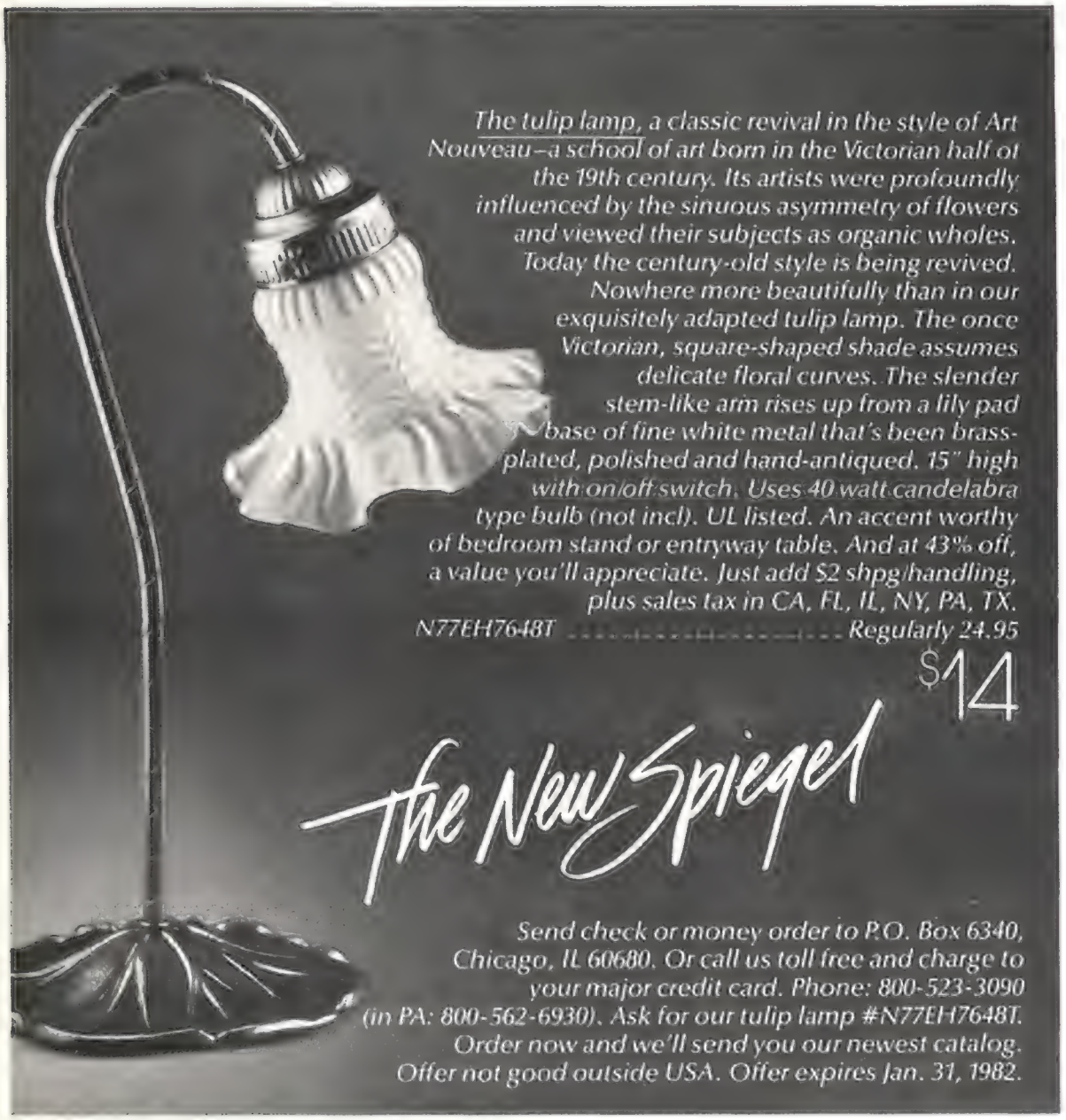

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building and dangled from the hands of a giant clock. But Lloyd more than made up for his late arrival in Beverly Hills. His Greenacres estate at 1225 Benedict Canyon Drive was probably the most expensive and most impressive star's dream palace of the 1920s—or ever, for that matter.

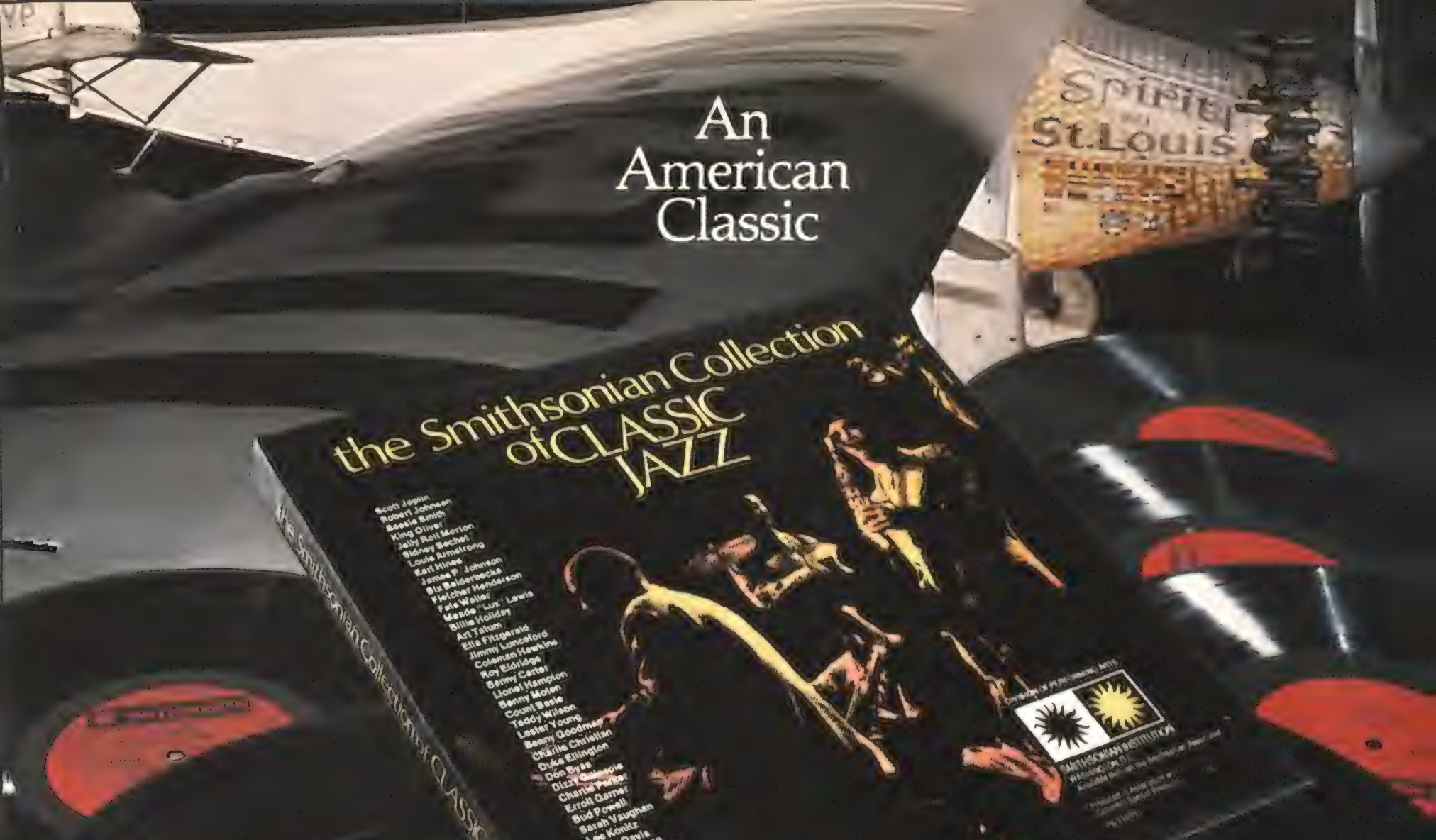
A gatehouse stood at the entrance to the estate, where visitors announced themselves before the uniformed guard let them pass. Then the tree-lined driveway led up the hill and past the seven-car garage and servants' quarters, past the greenhouses and into a courtyard with a fountain, before reaching the main entrance to the house.

Built on a knoll about 120 feet above Benedict Canyon Drive, the 36,000-square-foot pink stucco Spanish-style mansion boasted about 40 rooms and 26 bathrooms arranged around a central courtyard. The sunken living room had a gold-leaf coffered ceiling, elaborate paneling, a stone fireplace and a theater-size 40-rank pipe organ. Nearby were the formal dining room capable of seating 24 guests, a 100-seat private theater, a music room, where the Lloyds seldom played music, and a library with yards and yards of apparently rarely read leather-bound books. Not one, but two, paneled elevators ascended to the ten bedrooms on the second floor.

To keep Greenacres functioning smoothly, the Lloyds hired a staff of 32, including a butler, several maids, a cook, a kitchen staff, a valet for Harold, a lady's maid for Mildred and two nannies for the children, Gloria, Peggy and Harold jr. An operator ran the estate's very own telephone system from a switchboard near the kitchen.

Sixteen gardeners grew flowers and shrubs in the greenhouses, tended the 12 formal gardens scattered around the nearly 20 acres of grounds, and maintained the nine-hole golf course that lay in the flat canyon floor below the main house.

An American Classic



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If Lloyd's guests didn't want to play golf, they could swim in the Olympic-size pool, play handball and tennis or paddle around the 800-foot-long canoe lake near the golf course. Indeed, no spot on the grounds was far from the sound of water. Greenacres boasted 12 fountains and a 110-foot-high waterfall, lit at night, that tumbled down the steep hillside from a terrace near the house to one end of the canoe lake.

In order that Peggy, Gloria and Harold jr. play in the manner befitting a star's children, Harold and Mildred Lloyd built them their own dream-palace-in-miniature in one of the gardens: a child-size four-room thatched-roof cottage with plumbing, electricity and exquisite custom-made miniature furniture. But daughter Gloria apparently saw the cottage more as a responsibility than as a place for children to play. When Harold and Mildred Lloyd first showed her through the little house, she didn't say anything.

"What's wrong?" her parents asked.

"Oh, nothing," Gloria replied. "But where's the keyhole? How can I lock it up at night?"

Just as daughter Gloria seemed not to have enjoyed her playhouse, Harold and Mildred Lloyd appeared not to take full advantage of Greenacres. Although they had devoted three years and several million dollars to building the greatest showplace in the movie colony, they lacked the driving social ambition to turn Greenacres into another Pickfair. Nor did Harold and Mildred Lloyd make Greenacres into what is usually thought of as a family home. He often worked at the studio from early morning to late at night. She was engrossed in doing needlework and collecting Dresden china.

But the reasons for Greenacres' seeming failure as a star's home and as a family home went far beyond Harold and Mildred Lloyd's self-absorption. By building the movie colony's finest dream palace, the Lloyds had become trapped by the formidable physical perfection of their enormous estate and by the a-star-has-to-live-like-a-star ideal. The Lloyds must have understood this from the beginning. "What are we—damn fools?" they asked each other, according to Hedda Hopper, on moving day in 1928. "What did we do? This place is overpowering." On their first day at Greenacres, Harold and Mildred Lloyd rode up and down in one of the mansion's two elevators for over an hour. As Mildred later confided to a friend: "It was the only cozy place in the house."

At Greenacres. Harold Lloyd romps with his children in front of four-room playhouse complete with own plumbing, electricity and child-size furniture.

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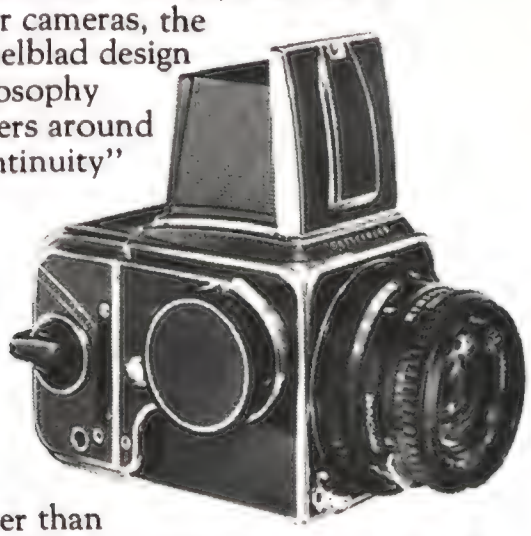

rather than "obsolescence". New accessories will fit Hasselblad cameras of 20 years ago.

In the long run, a Hasselblad not only pays for itself by its performance, but also retains its value. In fact, Hasselblad cameras have been sold, after years of usage, for more than twice the original purchase price.

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The 500 EL/M motor Hasselblad, ideally suited for fast shooting and remote control operation.

And then, the superb Hasselblad 2000 FC, with an electronically-controlled shutter that provides speeds up to 1/2000 second.

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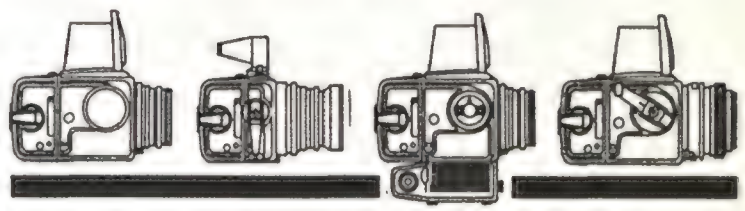

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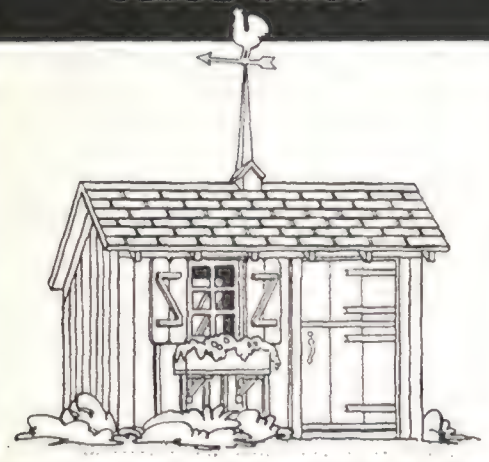

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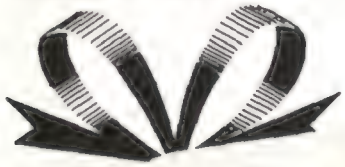

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Book reviews

Cowboy Culture: A Saga of Five Centuries
David Dary
Knopf, $17.95

The golden age of the Hollywood Western long ago rode into a technicolor sunset, but the mythos of the cowboy survives. It is a romantic vision that ropes America's imagination and holds it tight.

One might expect a book entitled *Cowboy Culture* to further the stereotype of the footloose and family-free, jingle-spurred drifter, the tough-as-rawhide man who punched cows by day and barroom rivals by night.

But David Dary's saga of the Old West is scholarly as well as colorful. Dary chronicles the rise and decline of the cowboy from the arrival of cattle in North America (Christopher Columbus in 1493 brought cattle to Hispaniola) to the invention of barbed wire in the 1870s and the end of open-range ranching.

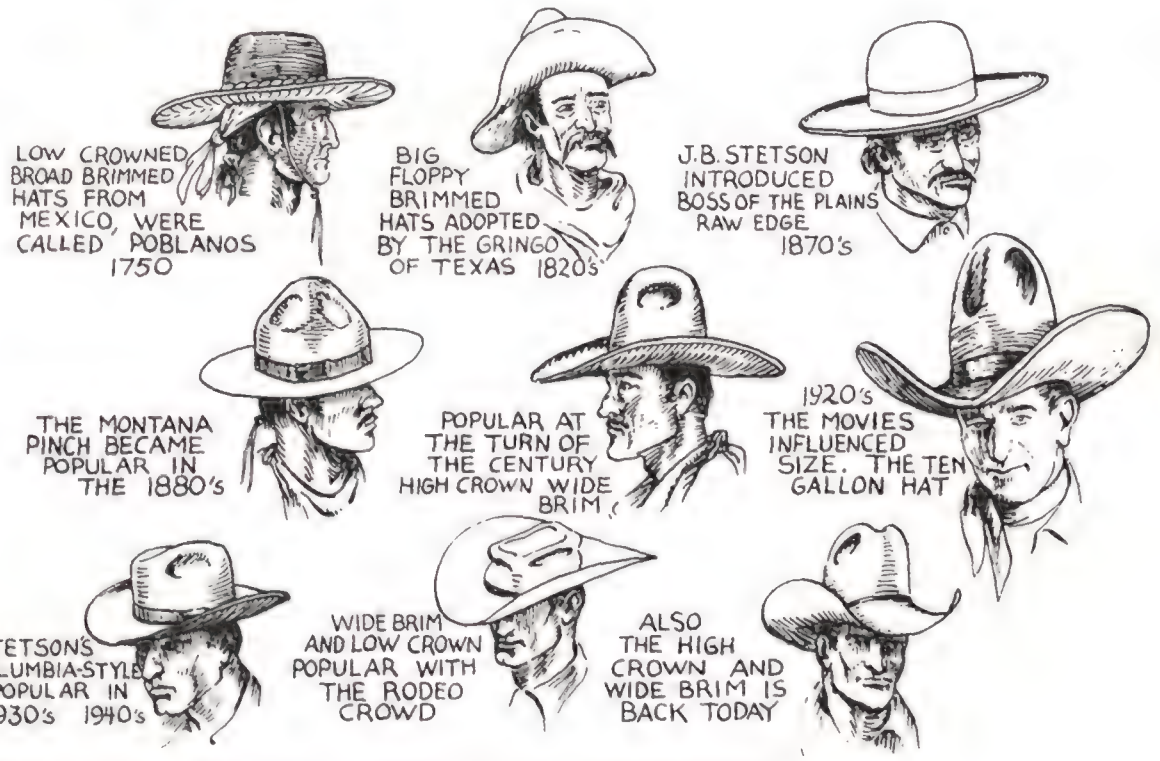
"The writers of films, television programs, and books . . . have not been the only ones to contribute to the myth of the cowboy," the historian charges. The fault, he concludes, also lies within his own ranks because many historians "simply ignored the cowboy and his culture and did nothing to correct popular misconceptions."

In *Cowboy Culture*, Dary attempts not only to set straight the over-glamorous image of 19th-century cowboy life, but to trace the origins of the trade.

The word "cowboy" seems to have Irish roots, he notes. Around A.D. 1000 horsemen and cattle wranglers were called "cow-boys" in Ireland. Six centuries later, in its attempt to provide cheap labor for the Colonies, Britain forced a number of these drovers to emigrate to America as indentured servants.

However, the American cowboy's strongest roots are Spanish. Much of the vocabulary and most of the traditions we associate with cattle ranching sprang from the 16th-century haciendas of New Spain, which comprised Mexico and parts of the U.S. Southwest.

Stockmen's organizations, open-range grazing, cattle roundups (or rodeos—from the Spanish verb *rodear* meaning "to surround") and branding all originated with the Spanish. Furthermore,


LOW CROWNED BROAD BRIMMED HATS FROM MEXICO, WERE CALLED POBLANOS 1750
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Cowboy hats, unlike many articles of attire, have remained functional through numerous modifications in style.

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the cattle of New Spain were the progenitors of the famous Texas Longhorns.

Nor was the trail drive an American creation, as Dary demonstrates in a fascinating aside about Francisco Vasquez de Coronado. "Cattle were so plentiful in New Spain by 1540," he writes, "that Coronado had no difficulty in gathering a herd of perhaps five-hundred . . . for an 'on the hoof' commissary to support his fabled Seven Cities of Cibola expedition."

Instead of finding treasure-filled cities, Coronado discovered the semiarid American Southwest, a region destined one day to count much of its wealth in cattle.

Such anecdotes enliven Dary's writing, as do numerous excerpts from the writings of cowboys, ranchers and travelers: "Never was this party so completely used up as when we came in from the desert," a cattleman wrote in his diary near the end of a Missouri-to-California trail drive in 1850. "We were so overcome with sleep that we were obliged to get off our horses and walk for fear of falling off . . . all alike were sleeping while walking."

Dary emphasizes that a cowboy's work was more exhausting and less adventurous than is usually depicted in fiction. He quotes a telling bit of wisdom from the memoirs of Texas cowpuncher James Emmit McCauley, who died in 1924. McCauley advised young men to "stay at home and not be a rambler, as it won't buy you anything. And above everything stay away from a cow ranch, as not many cowpunchers ever save any money and 'tis a dangerous life to live."

If McCauley were alive today, perhaps he would enjoy Ed Bruce's Country-Western story song recently repopularized by Waylon Jennings. "Mamas, don't let your babies grow up to be cowboys," Jennings croons. But few mothers need worry about such things today. As Dary points out, "the golden age of the real cowboy in the American West was gone as the 20th century dawned."

Alicia Fields
Denver writer and editor

When Harlem Was in Vogue
David Levering Lewis
Alfred A. Knopf, $17.95

The title says a lot, and it is already sad, elegiac. And ironic. In other words, Harlem and its great cultural flowering of the 1920s, the Harlem Renaissance, was a passing, albeit serious, fad among white

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intellectuals. This is often the underside of Afro-American life: to be defined by and for the white majority. Yet Afro-Americans have on occasion generated an independent life-style and forms of creativity, determining their self-image and public persona. The Harlem Renaissance was one of those times. Its leaders took advantage of the conditions imposed by prejudice and the appeal of exotic "otherness," to systematically push, cajole and groom their chosen into preeminence in the arts, the only field, as David Levering Lewis points out, largely free of the racial proscriptions found elsewhere.

The advent of the New Negro, a term immortalized by philosopher Alain Locke's 1925 anthology of that name, produced one of those rare historical moments when an astounding group of personalities and events intermingled. W. E. B. Du Bois, brilliant, Harvard-educated black Brahmin, came to Harlem to work with the NAACP and edit its magazine, *The Crisis*. He was joined by Walter White, Afro-America's famously light-skinned senior statesman, and by Charles S. Johnson, a University of Chicago-trained sociologist who became a director of the Urban League and editor of its influential monthly, *Opportunity*. Claude McKay and James Weldon Johnson were encouraged to write their rich prose and poetry, Jean Toomer conjured up his masterful book, *Cane,* before disappearing in a cloud of racial identity crises.

Langston Hughes expressed himself in lasting works and had enough adventures at home and abroad to fill a dazzling autobiography—and did so, in *The Big Sea*. Countee Cullen strutted his poetic stuff, Zora Neale Hurston burst onto the scene with her folktales and flamboyant behavior, Aaron Douglas recorded the era with his paintings. Wallace Thurman shocked the genteel and elitist "Niggerati" by introducing the proletariat into the elevated realm of Renaissance literature; his periodical, *Fire*!!, seemed to set that staid sphere ablaze.

Ragtime, jazz, cakewalk, gospel and such popular Broadway musicals as *Shuffle Along* resonate throughout Lewis' text. Harlem gave us the nightclub, although the only blacks allowed in the opulent Cotton Club were the performers and mostly young "high yellow" females.

The world of Harlem was a world of paradox, and the ambivalences epitomized the experience of American blacks at

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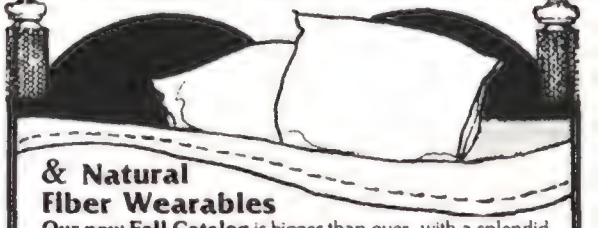

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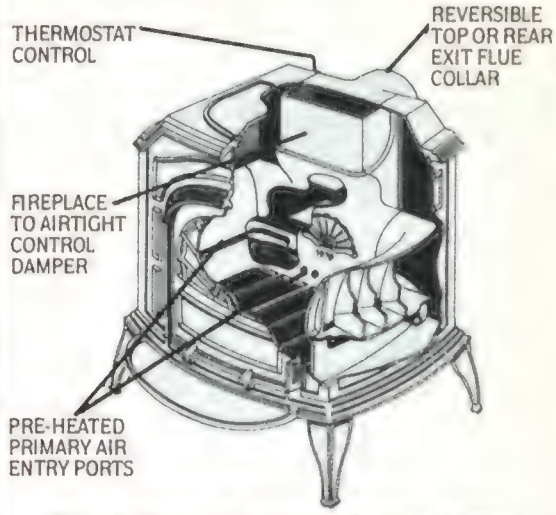
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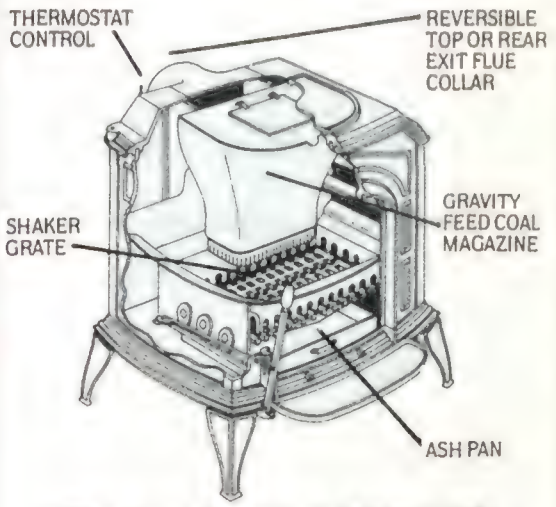

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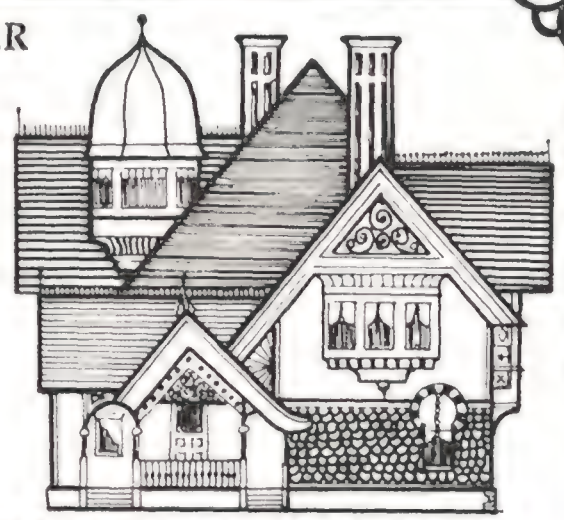

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the time, whether aristocratic or working class. Whiteness and the ways of white folk were desirable, but so was a pride in one's race: nothing was more hierarchical than Afro-American society, but it was also important to present a united front. And the closeness among Afro-Americans and their white friends went only so far.

Lewis accentuates the telling ambiguities of his subject matter with wit and grace and wry humor. He charts his course through the physical configurations of Renaissance life, as swank apartment buildings seem to spring up before our very eyes (some with their own newspapers), as the Stanford White-designed Striver's Row spawns countless more modest housing units, and as the map of Manhattan above 110th Street becomes an unforgettable lesson in social geography. The lower classes, crowded together in tenements and the first to feel the falseness of any economic promises from white America, were most susceptible to the excess of evangelical religiosity that had migrated up from the South.

But when the Depression hit, it made no distinctions between rich and poor blacks, between charlatans and saviors. For many people, a drive through Harlem today is a trip through a wasteland, a place that has often been compared to a bombed-out city. But that place is not empty, nor desolate. David Lewis' book brings its past alive again, so that the poised and posed couples in James Van DerZee's photographs (see SMITHSONIAN, June 1975) seem to nod and beckon from every street corner. As for the present and the future, they are cared for more and more by a new and vigorous generation.

Celia Betsky
Associate Editor
Portfolio magazine

Pavarotti: My Own Story
with William Wright
Doubleday, $14.95

No one will deny that he is a superstar, but by the time Hollywood releases his movie filmed this summer, Luciano Pavarotti can surely claim to be the world's most *ubiquitous* superstar. For, in the meantime, television has brought this *primo tenore* of grand opera into our homes, not only in live performance from the Met but as a talk-show celebrity, star of TV specials and pitchman for American Express cards. His recordings are best

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sellers, his concerts standing-room only. Now he can be seen in every bookstore, grinning under a white tennis hat from the cover of his autobiography.

Well, not autobiography in the strict sense, although Pavarotti does tell his "own story" to his coauthor, William Wright, in a dozen brief chapters. The balance of this pleasant if not very profound book is a collection of monologues,

Pavarotti in *La Gioconda*: "I was forty-four before trying Enzo."

some of them adulatory, by old friends, colleagues, a teacher, his wife and his manager. Wright contributes the liveliest chapter (in addition to one other and a graceful preface). It recounts in intimate detail a typical lunch at Villa Giulia, Pavarotti's summer home in Pesaro, on the Adriatic. Actually, the chapter covers most of a day in August 1979. It begins with such activities as posing for a newsmagazine photographer, a brief session at his easel (he is an enthusiastic painter as well as horseman, tennis player and gastronome), an even briefer one at the piano with his vocal coach, and it ends in late afternoon, after the party disbands, with a nap in his hammock. But the focus is on the two-and-a-half-hour, five-course meal—the food itself, the 17 diners including family, relatives, professional associates and other visitors, and their desultory talk. It is skillful reportage. Wright is a thorough as well as affectionate observer, so that the reader not only is present at the event but is an appreciative participant, marveling at the pasta and veal, delighting in the gossip, adoring the happy host unashamedly.

Like the florid art form he practices to such frenzied response, Pavarotti is larger than life, and hyperbole too easily be-

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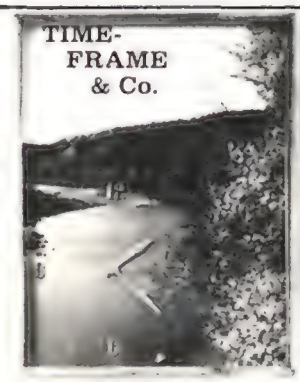

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comes the norm when others talk and write about him—even in the parts of his book where his friends and associates strain to make critical observations. For example, John Wustman, his accompanist, notes that Pavarotti is not a "technically proficient" musician, but he hastens to write that he is "super, super, super musical." There is a good deal of that praising with faint damns, even when the great one himself essays objectivity. His voice, he acknowledges, for all the hard work and sacrifice that went into training it, is "a gift from God," and as for comparison with Caruso's: "With all due respect, I do not agree with Maestro von Karajan's remarkable comment that my voice is greater."

Pure opera buffs, as opposed to Pavarotti fans, will probably feel they did not get their money's worth. There is an absence of solid musical appraisal and of authoritative effort to get at the substance of his artistry. Instead, we have his manager explaining the complicated process of promoting "the highest-paid concert singer in the business" and his wife allowing that, although Luciano loves people, "women bring out something in him that borders on veneration." Also, the book's format invites repetition of facts and anecdotes. More careful editing would have reduced the number of times, for example, we are told that the tenor in *The Daughter of the Regiment* must hit nine high Cs in one aria.

But with such an appealing subject, these excesses are more amusing than offensive, and the book goes down as easily as Rodolfo's *"Che gelida manina"* in *La Bohème*, one of Pavarotti's favorite roles. He will be forgiven if, as with his TV and Hollywood ventures, the book not only enhances his enormous popularity but also wins larger audiences for opera.

James Idema
Chicago free-lance writer

The Comet Is Coming!
Nigel Calder
Viking, $12.95

Halley's Comet is coming back, and Nigel Calder rather wishes it wouldn't. He finds only the mildest intellectual interest in comets themselves, and is appalled at popular reaction to them. Yet here is his book, published nearly five years before most of us will see the comet, based in turn on a BBC television program. Calder

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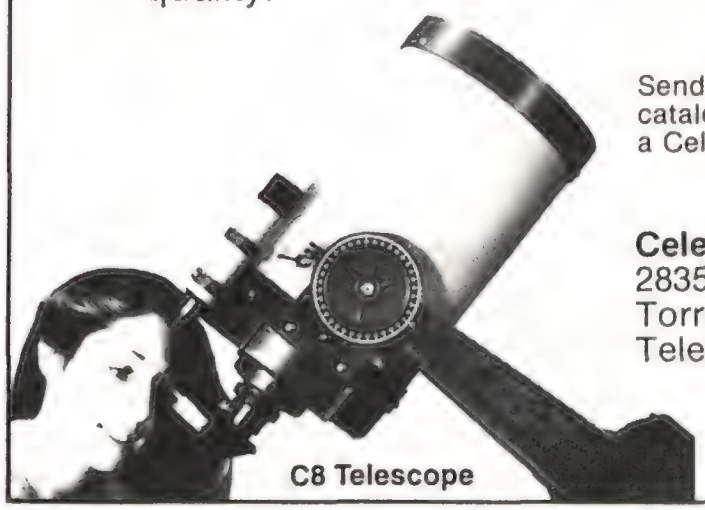

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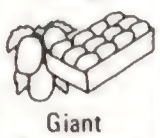
June Gala Apples	**July**  Giant Kiwi Berries	**August** Exotic Nectarines
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hopes to "inoculate the more reasonable sections of the public against the predictable nonsense of Halley's return," but others may consider his book the beginning of the hoopla.

Halley's is the most famous comet of all. The first principle of astrosociology, according to Calder, was best expressed by a Smithsonian Astrophysical Observatory astronomer, Brian Marsden: "To the man in the street, the Solar System consists of Mars, the Rings of Saturn and Halley's Comet." Writers have used the comet to measure time: Loren Eiseley followed human evolution backward in *The Invisible Pyramid* by the ticks of Halley's appearance every 76 years until he reached a point when the brutes did not look up at the fire overhead.

Like them or not, Calder does a marvelous job of telling us all we could ever hope to know about comets, and a lot of things we would never have thought to ask. He follows appearances (aptly known as apparitions by astronomers, he notes) of Halley's from its first "fairly definite" identification in 87 B.C. through 1066, at the time of the Norman conquest of England, to 1301, when the Florentine painter Giotto di Bondone saw it and incorporated it in a fresco showing the wise men from the East adoring Jesus.

We stand with newly married Edmond Halley at 6:30 on the morning of November 22, 1682, when he first sees the bearded star that will one day bear his name. (Calder considers Halley the founder of modern cosmology, geophysics, oceanography, meteorology, demography and stellar astronomy; Halley would count as a famous man of science had his name not been attached forever to a "cosmic bauble.") By 1695 he was convinced the comet he had seen was the same one seen in 1531 and 1607. And in 1705 he predicted it would return in 1758. He died in 1742 but on Christmas Day of 1758 a Dresden farmer first saw the comet again. Halley was immortal.

Comets are rarely spectacular (and Halley's won't be, this time around) but they are not rare. In an average year a dozen are seen, half of them known comets returning on schedule, the others being seen for the first time. Marsden has more than 660 catalogued at comet headquarters in Cambridge, Massachusetts. And current theory holds that more than 100 trillion of them are stockpiled a half light year out from the sun, not to be seen

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until a passing star nudges them into a multi-million year fall in toward the sun.

Calder gives a new understanding of what was our concept of a comet until 1970 or so: what I had always thought of as a flying gravel bank makes more sense as an orbiting hailstorm. Today comets are seen, thanks to former Smithsonian Astrophysical Observatory director Fred Whipple, as dirty snowballs. Halley's is estimated to be three miles across, weighing 6.5 billion tons, spinning on its axis every ten hours.

(While reading the book I had a horrible vision. Far in the future an ambitious museum would capture a small comet, steer it back to Earth, ease it down to the ground in Alaska, build a huge hangar-like building around it, and charge admission. A wispy illusion from outer space would end up looking like snow in New York gutters three days after a storm. It hurt.)

The book covers more than comets themselves. One chapter discusses the remarkable ideas of Sir Fred Hoyle and Chandra Wickramasinghe, who see comet dust settling to Earth as the source of the influenza epidemics that periodically ravage the globe's population. Another has to do with comets hitting the Earth: a small one apparently did on June 30, 1908, and a much larger one may have about 65 million years ago, throwing up enough debris to produce four years of darkness and the end of the dinosaurs (a theory not accepted by everybody).

We're by no means out of danger, according to Calder. A group of asteroids that cross Earth's orbit, known as apollos, apparently are actually dead comets, "dark micro-planet[s] comprising a stony and tarry residue, perhaps a kilometer in diameter. . . ." Thirty are known, and astronomers infer the existence of hundreds. More than one in four will collide with Earth sooner or later. Fortunately, this translates to once every 250,000 years. We can expect larger ones, of the size that may have done in the dinosaurs, once every 100 million years.

Some day, Calder suggests, we will stand ready to intercept any dead comet that threatens. Right now we would like to get to a live comet and see what really is there. A launch in 1985 would get us to Halley's in 1986. The European Space Agency will send a probe named Giotto, the Japanese are launching "Planet A," and the Soviet Union plans to fly a Venera

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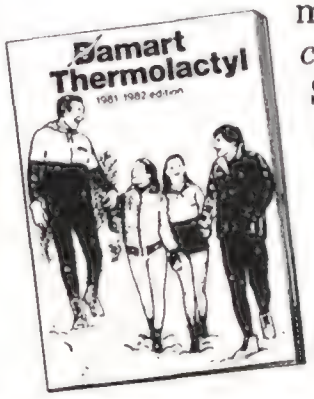

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past the comet after a trip to Venus, releasing French probes into the comet.

The United States has canceled its own plans, including elegant designs for a craft with seven-kilometer wings that would have sailed on the solar wind to the comet, and another with an ion engine that could have cruised with the comet for six months and even landed on it. There's still time to build a Halley Intercept spacecraft, using parts from Viking, Voyager and the new Galileo spacecraft, but it's not at all clear that the necessary money will be forthcoming. Most indications have been otherwise.

In June, however, the House of Representatives added $5 million to the NASA budget for engineering studies; the Senate asked the White House to reconsider its rejection of the project, and the Jet Propulsion Laboratory out in Pasadena reminded everyone that a decision must be made by Christmas or we'll miss the comet.

JPL's original proposal called for $300 million, but scientists suggest that with various economies and modifications the new $5 million and the $25 million NASA says it can produce will finance the project's first year. It won't happen, of course, unless the Administration agrees to budget money next year to keep it going.

Calder probably would vote against

The Bayeux Tapestry records 1066 apparition, an early "portrait."

spending the money. In the first three pages of chapter one, he calls comets a "swindle" and the "cosmic equivalent of an oil slick." Their motion through the sky is "slovenly," he says, and they are "a conspicuous form of sky pollution."

But comets are exciting (I remember my heart skipping when I stepped out the door before dawn one morning in 1965 and saw Comet Ikeya-Seki shining like a searchlight over Schunnemunk Mountain). And Halley's is the most famous of all. Its 76-year period makes it a natural measure of a human lifetime. Calder's sneers are no match for the comet's hold on the rest of us.

Consider Mrs. Victoria M. Craigie of Burbank, California, who, in a letter to us on another matter, wrote:

"I'm still angry about the time (1910) when my parents took my three older brothers out to see Halley's Comet—and didn't wake me up to see it, as well. I understand that, this time around, it will be in poor viewing position, and I doubt that I can 'make it' on its next swing by."

Poor viewing position and all, Halley's Comet is certain to cause great excitement on its return. Calder's book is an excellent introduction for those of us who have not had the pleasure.

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Board of Editors

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Additional reading

Video games (p. 50)

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Falkland Islands (p. 84)

The Falkland Islands by M. B. R. Cawkell *et al.*, St. Martin's, 1960

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Perim-A-Tron's™ central console, or "BRAIN", employs a microprocessor, making it the **most advanced security system available for consumer use.** With Perim-A-Tron™ on duty, small sensors monitor doors and windows ready to signal the "Brain" from as far as 250 feet, in the event of a break-in attempt. The "Brain" processes each signal instantaneously and sounds not only a self-contained 85db internal alarm, but also a second 95db remote siren to augment the inside alarm or for placement outside to alert neighbors and police.

The Perim-A-Tron™ is so easy to live with that pets can come and go through partly-open windows or sliding glass doors without triggering it, yet so vigilant that an intruder will set it off before he can enter.

THOUSANDS OF OPTIONS

Perim-A-Tron's™ micro-computer lets you choose from thousands of three digit disarm codes. **Only you know your code.** But if your son's friend receives a "demonstration", you can easily change the code again ...and again. You need no specially coded key which can be lost, misplaced, or stolen. The system even has two separate channels, each with its own distinct alarm sound. This feature allows you to zone your system. For example: Channel 1—house, Channel 2—garage, or Channel 1—doors, Channel 2—windows.

HOW IT WORKS

Operating the system is simplicity itself. When leaving, a light on the console tells you that you've armed the system properly, and have from 5 to 45 seconds to leave the house. This variable delay feature, not found on some expensive commercial systems, is selective so that it can apply only to frequently used doors. All other openings would be set for instant alarm. Upon returning home, you have ample time to turn the system off, thereby avoiding a false alarm.

If a break-in attempt occurs while you're away, an alarm memory light on the console tells you so. What's more, after sounding for 10 minutes and scaring away the intruder, the system shuts off automatically and resets itself.

This photo shows a transmitter & magnet installed. If a break-in attempt occurs, the transmitter and magnet become separated triggering a wireless radio signal which activates the alarm. Installation takes only a few minutes and doesn't even require a screwdriver.

A CONSTANT GUARDIAN

Leave Perim-A-Tron™ in Test Mode during the day and it will signal when anyone leaves or enters. This thoughtful signal will not operate the remote horn but gives a 2½ second warning on the internal speaker only.

If power fails (or is cut-off), the console has a battery back-up. And each battery powered transmitter/sensor will signal at the console if the battery runs low.

The Perim-A-Tron™ system is **highly resistant to false alarms because it is not sensitive to motion or sound.** Pets can roam at will, curtains can blow in a breeze, you or your children can visit the kitchen for a midnight snack— all without setting off an alarm.

COMING HOME SAFELY

There is nothing more frightening than finding a prowler lurking near your house when you arrive home at night. Our system's EXTRA PROTECTION DESIGN lets you carry a transmitter in your pocket, purse or glove compartment (it's about the size of a cigarette pack). With simple modification, it serves as a PANIC device and will set off the alarm at the press of a button.

COMPARE IT

Hard-wired "commercial" burglar alarms can cost $2,000 PLUS a monthly fee (and you still never own it). Motion and sound detectors cost up to $200 per unit and cover only limited areas. Your home may require two or three of these units and, in most cases, no alarm will sound until AFTER a prowler is inside for 30 seconds or more. Perim-A-Tron™ combines **pre-entry** protection with micro-electronic circuitry to provide the most protection at the lowest cost.

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The Perim-A-Tron™ Home Security System is listed by Underwriters Laboratories as a **burglary protection device,** a rating which goes beyond electrical safety. To earn this listing our alarm was thoroughly tested for critical burglary protection functions such as transmitter range, sound volume, battery back-up, keyboard component life, battery failure warning, and test function. This tough-to-get U.L. listing resulted from the exacting standards engineered into the Perim-A-Tron™.

YOU BE THE JUDGE

We urge you to order just the basic Perim-A-Tron™ system (pictured above) for a 30-day trial period. Use it to protect your family while you sleep and to protect your home while you're away. Then if you're not convinced that the Perim-A-Tron™ is the most advanced, efficient security system available today, return it undamaged for a complete, no-quibble refund—including return postage. You are protected by a 90 day manufacturer's warranty as well as Shelburne's 25 year reputation for satisfied customers.

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To order simply send your check for **$199.95** plus $4.50 for shipping and handling to the address below. Credit card holders can speed delivery of their system by using our toll-free number listed below. We will then promptly ship your Perim-A-Tron™ unit complete with easy-to-understand instructions and decals warning that the premises are protected. Additional transmitters are available for $29.95 each, but one is not required for every door and window. Instead, magnetic contacts can be purchased and easily connected to the transmitter, allowing you to cover additional openings for as little as $5 each. The instruction booklet is quite useful in helping you determine the correct combinations to protect your home at the lowest possible cost.

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Harold Lloyd, The Shape of Laughter by Richard Schickel, New York Graphic Society (Boston), 1974

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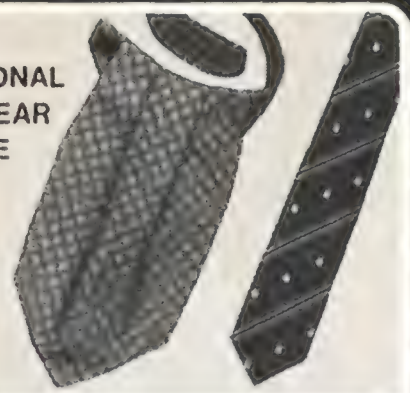

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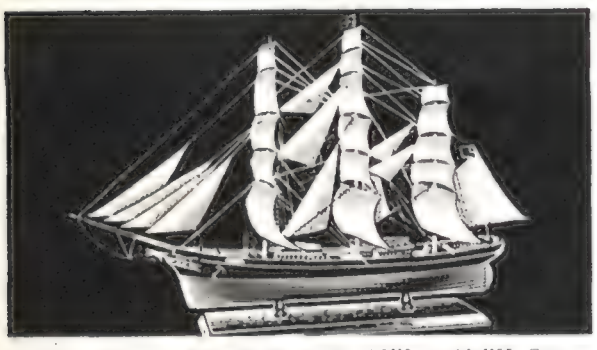

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Smithsonian highlights

On September 15, exactly 150 years after its first U.S. test run on its arrival from England, the stately old John Bull locomotive will be on the tracks again. Anyone who comes down to the C&O Canal in Georgetown around 10 A.M. can witness this historic chug to Chain Bridge.

Ten days later, for the first time in its history, the Freer Gallery will open an exhibition of its entire collection of Indian Mughal paintings. These dazzling works interpret the lives of the Mughal emperors, Hindu epics and other delightful subjects in vivacious detail.

Special September events

National Air and Space Museum
Fifth Annual Smithsonian Frisbee Festival (September 6, noon) Demonstrations and workshops.
Sir Barnes Wallis, Designer (September 24, 7:30 P.M.) Talk by N. W. Boover.
The Bombing Years: A View from the Cockpit (September 29, 7:30 P.M.) Talk by Group Captain T. G. Mahaddie.
Films (September 10, 17; 7:30 P.M.).
Encounter with the Ringed Giant (September 5, 9 A.M.) Monthly sky lecture covers Voyagers I and II and Saturn.

Hirshhorn Museum & Sculpture Garden
R. B. Kitaj (September 17-November 15) The first comprehensive retrospective in the United States of this artist's work.
Larry Rivers: HM&SG Collection (through September 20) Some 40 works.

National Museum of American Art
The Bronze Techniques of Frederic Remington (September 18-January 3).
George Catlin: The Artist and the American Indian (through September 13).

Renwick Gallery
Venini Glass (through March 21) Retrospective exhibition of some 150 vessels from Venetian firm.

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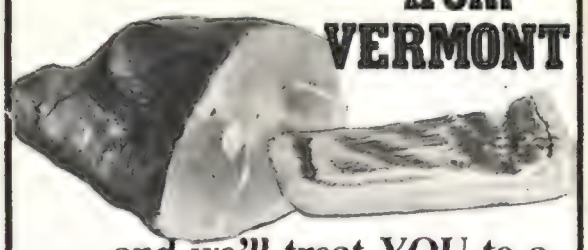

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National Portrait Gallery
Charles Willson Peale as Printmaker (through January 3) Portrait prints.
We Never Sleep: 50 Years of Pinkerton Men (through January 3) Saga of this detective agency and its personalities (SMITHSONIAN, August 1981).

Freer Gallery of Art
The Imperial Image—Painting for the Mughal Court (September 25-January 28) Survey of richly painted manuscripts from the Indian Mughal Court (below).
Korean Art (through September 15) Ceramics, paintings and metalwork.
Turkish Art Ceramics, drawings, textiles and jade.
Eastern Kufic Calligraphy Koran pages.
Japanese Fans Illustrates importance of fans in 16th-19th century society.

At Freer: 16th-century *Ramayana* scene

National Museum of Natural History
Two Contemporary Bird Painters in Oregon Territory (through October 4) Oils and watercolors by L. B. McQueen and H. J. Janosik
5,000 Years of Korean Art (through September 30) Major exhibit includes some 350 objects.
Contemporary Korean-American Arts (through September 30).

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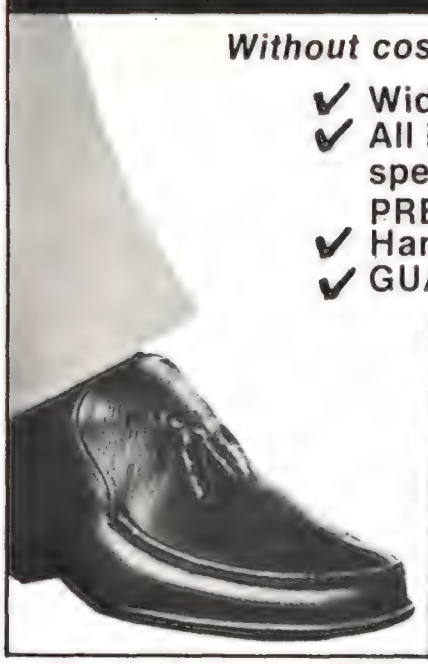

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Magazine Covers (through November 1) Some 150 covers from mid-19th century to the present.
Americans in Glass (through November 14) Glass objects representing various contemporary techniques.

National Museum of American History
John Bull Locomotive—Under its Own Steam (September 15, 10 A.M., CSX Branch RR Tracks, C&O Canal) Reenactment of test run 150 years ago of this historic locomotive.
Perfect in Her Place (through January 24) Women at work in the 19th century.
Platinum Women Turn-of-the-century "platinotypes" of 52 fashionable women.
The Commodores (September 2; 6 P.M., Carmichael Auditorium)—Jazz concert.

Smithsonian events

For ticket and price information on Resident Associate events, call 357-3030:
Basketball's Golden Moments (September 14, 8 P.M.) An evening with "Red" Auerbach and Bob Cousy.
Korea and China: Correspondences in Art (September 9, 8 P.M.) Slide lecture by Asian art historian Robert Mowry.

Regional Events

The Regional Events Program goes on the road September 28-October 3 to Austin, Texas, with presentations on forensic anthropology, Texas art and artists and North American prehistory. Programs planned for Louisville, Kentucky, October 9-18, include parent-child sculpture workshops, American folk music, 19th-century orchid collecting and the art of gold leaf. Associates in both cities will receive invitations. For information, write: Regional Events, 1208 A&I Building, Smithsonian, Washington, D.C. 20560.

Radio Smithsonian

Korean art, a sampling of the Stradivari string instruments in the Division of Musical Instruments and a discussion on "Is Democracy for Everyone?" in collaboration with the Woodrow Wilson International Center for Scholars are among the September listings for Radio Smithsonian and Smithsonian Galaxy, broadcast nationwide. To find out which area stations carry either program, write: Smithsonian Office of Communications, A&I 2472, Washington, D.C. 20560.

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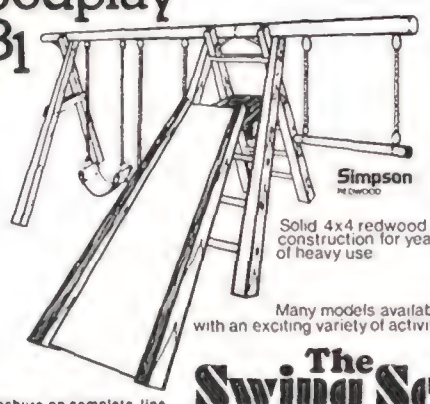

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Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities outside Washington. To sponsor a show in your community, write to Eileen Harakal, SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some September exhibits:

Wilmington, Delaware (September 19-November 1) *From All Walks of Life,* Delaware Art Museum.

Miami, Florida (September 5-October 4) *A Collector's Eye: The Olga Hirshhorn Collection,* Visual Art Gallery, Florida International University.

Rome, Georgia (September 12-October 11) *Blacks in the Westward Movement,* Chieftains Museum.

Evanston, Illinois (September 12-October 11) *Designs of the N'Debele,* Mary and Leigh Block Art Gallery.

Topeka, Kansas (September 12-October 11) *Blacks in the Westward Movement,* Kansas State Historical Society.

New Orleans, Louisiana (September 4-October 18) *The Graphic Art of Mary Cassatt,* New Orleans Museum of Art.

Fayette, Missouri (September 12-October 11) *Biological Photography,* Stephens Museum of Natural History.

Farmington, New Mexico (September 19-October 18) *We'll Never Turn Back,* New Mexico State University.

Dayton, Ohio (September 12-October 11) *Western Views and Eastern Visions,* Dayton Art Institute.

Oberlin, Ohio (September 5-October 4) *Musical Manuscripts,* Allen Memorial Museum.

Houston, Texas (September 19-October 18) *The Image of the Black in Western Art,* University of Texas.

Morgantown, West Virginia (September 5-October 4) *Images of Labor,* Monongalia Arts Center.

Membership benefits

Begin your Smithsonian visit by stopping at the Associates Reception Desk in the castle. Here from 10 A.M. to 4 P.M. daily a warm welcome includes special membership materials and complete details about benefits: dining in The Court, relaxing in the Lounge, discounts in museum shops and a slide/lecture orientation to the 13 museums.

To receive a free previsit information packet, send postcard or phone Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560 (202-357-2700 or, for hearing impaired, TDD 202-357-1729). Allow two weeks for receipt.

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Detroit Symphony Orchestra	Steinway	7	Others 5
Houston Symphony Orchestra	Steinway	10	Others 2
Indianapolis Symphony Orchestra	Steinway	6	Others 1
Los Angeles Philharmonic	Steinway	6	Others 0
Minnesota Orchestra	Steinway	9	Others 1
New York Philharmonic	Steinway	12	Others 3
Oklahoma Symphony Orchestra	Steinway	2	Others 0
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Philadelphia Orchestra	Steinway	9	Others 2
Pittsburgh Symphony Orchestra	Steinway	9	Others 1
St. Louis Symphony	Steinway	6	Others 2
San Antonio Symphony	Steinway	5	Others 1
San Francisco Symphony	Steinway	12	Others 2
Seattle Symphony Orchestra	Steinway	2	Others 2
Tulsa Philharmonic	Steinway	2	Others 0
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The apes move in—and out

The $2.9 million Great Ape House has multistory cages, medical quarantine areas and solar collectors, which help heat water used to clean exhibit space.

A few weeks ago Nikumba stepped through his door, ran a brisk circuit around the yard and returned to his cage. In the past 24 years, this was the gorilla's first time on grass. It won't be the last.

With the completion of the National Zoo's Great Ape House, the residents—six gorillas and four orangutans—enjoy an improved standard of living. "The old building was built in the Thirties," says mammalogist Miles Roberts. "The public couldn't get close to the animals and the animals had very little to do. Apes are intelligent and need stimulation." The small dingy cages were scenes of frustration and neurotic behavior—spitting, throwing things, pounding on the walls. Nikumba would grind his teeth.

The new $2.9 million structure illustrates some current concepts in the field of zoo architecture. The large yards are separated from people by dry moats and a concrete barrier topped by an electric wire. Glass walls, five layers thick, replace bars. Cage floors, made from an epoxy grit, are heated, textured and stain resistant. Concrete "trees" with springy fiber glass "branches" replace the old metal pipes and truck tires. A television set can be tuned to cartoons, sports or other action films for any ape that wants to watch. (So far, few have.) The indoor central viewing area is bright with skylights, greenery and small pools. Visitors view the gorillas from ground level, then can walk up ramps to see the orangs, who like to swing in the trees. Sometimes the animals are only inches away.

The close proximity calls for respect. "We hope people will learn proper etiquette with these normally shy creatures," says Roberts. "You shouldn't stare at them or bang on the glass, or they'll just go away." The cages have small cubbyholes where the apes can retreat for privacy, part of the effort to design the building as much for the animals as for people.

Carol Simons

Four-year-old Bonnie cavorts near the pool in orangutan yard. Before moving to new quarters, some adult apes had not touched grass in more than 15 years.

Skylights and plants brighten interior of building, which was opened last spring. Old cages had metal pipes and tires; new artificial trees have springy branches.

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Florida Keys October 19-25: An active program of snorkeling, canoeing and swimming to study the ecology of Big Pine Key and colorful coral reefs.

Sapelo Island November 8-14: Camp on unblemished beaches while studying the marine ecology, Indian ruins and history of this Georgia barrier island.

Christmas at the Smithsonian December 4-6: Join curators and staff for behind-the-scenes tours of specially selected museums and tenth annual tree-trimming gala.

Baja Whale Watch February 12-20: Sport-fishing boat serves as base for observing gray whales; hikes and lectures focus on the natural history of the Baja islands.

South Texas Wildlife February 18-25: Follow the winter bird migration to the Gulf of Mexico and Rio Grande Valley while visiting the wildlife refuges of Aransas, Padre Island, Laguna Atascosa and Santa Ana.

Yellowstone in Snow February 19-28: Cross-country skiing in Jackson, Wyoming, and Yellowstone National Park to discover the splendors of nature.

Washington "Anytime" Weekend Choose any weekend to visit your choice of Smithsonian museums, spend two nights at Loew's L'Enfant Plaza Hotel or Hyatt Regency Washington, each close to the Mall, and see other sights in the city by Tourmobile. Reservations and payments at least ten days prior to arrival.

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The Ancient World of Peru September 18-October 2: Visit Lima and major archaeological sites along the coast; then explore the Inca capital of Cuzco, amazing Machu Picchu and colorful Indian markets.

Smithsonian Seminar in Salzburg October 3-18: Study the history of the opera or the Baroque era while living in a lakeside palace built in 1736. Theater, concerts, museum visits and German lessons enhance plenary lectures in this rococo setting.

Kyoto Seminar November 6-22: A unique program to study Japanese culture and live in Japanese style. Scholars conduct seminars in art, history and introductory language lessons and lead field trips to the great temples, shrines and lovely gardens of Kyoto and Nara.

India Wildlife Safari November 16-December 11: Visit major wildlife sanctuaries to observe the magnificent animal life of the subcontinent. Travel to parks in Northern and Central India and Nepal's famous Tiger Tops. Includes Bombay, Delhi, Jaipur and Agra, site of the Taj Mahal.

Baroque Winter: Vienna, Salzburg, Munich January 3-17: The splendors of Central Europe in the new year with walking tours, museum lectures, opera and concerts in Vienna, Mozart's Salzburg, and the Bavarian capital. A special Smithsonian Viennese Ball is included.

Panama and the Spanish Main January 9-16: Experience the thrill of traveling from the Pacific to the Atlantic through the Panama Canal. Continue to the fascinating San Blas islands, then the Spanish Main bastion of Cartagena. Our chartered ship *Jason* also calls at Bonaire in the Dutch Antilles, Barbados and Margarita—the pearl island.

Mayan Mexico: The Yucatán Peninsula January 21-February 2 or February 10-22: The extraordinary ruins of the Yucatán in the company of an archaeologist—Uxmal, Palenque, Labná, Sayil, Kohunlich, Cobá, Tulum and Chichén Itzá.

Kenya January 28-February 14: Incomparable wildlife is observed in old safari tradition. Seminars in Nairobi, and in the field at Masai Mara, Samburu, Kilaguni. Meet local citizens and visit a school and handicraft center.

Tall Ship Adventure February 12-21: Set sail on the luxurious 317-foot, four-masted sailing yacht *Sea Cloud* from Antigua to the Grenadines. Lectures and excursions enhance this fabulous sailing experience in the Caribbean.

Zapotec and Mayan Mexico February 24-March 8 or March 17-29: Oaxaca and Zapotec sites of Monte Albán and Mitla; San Cristóbal de las Casas; Palenque, Uxmal and other Mayan ruins in the Yucatán.

Red Sea Passage February 25-March 7: Sail from Suez on the *Argonaut*, visit Karnak, Luxor, Valley of the Kings, Abu Simbel in Egypt and Petra in Jordan. Tour the mosques and bazaars of Cairo, the Sphinx and pyramids at Giza. Optional Jerusalem prelude—February 18-26.

Australia March 19-April 6: Discover the diversity of "Down Under." Visit Sydney, Melbourne, the Barrier Reef, Alice Springs and Ayres Rock.

Ecuador and the Galápagos Islands April 4-15: Visit Quito, then travel by train to Guayaquil to board the *Buccaneer* for a seven-day voyage through the Galápagos Islands. Participate in seminars and meet with scientists at the Charles Darwin Research Station; observe the rich plant, bird and animal life.

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. 20560 or call (202) 357-2477 for specific tour brochures

in Washington

Selected Studies Seminars

Now is the time to enjoy the latest popular programs at the Smithsonian which combine excellent speakers and behind-the-scenes tours. Choose from:

Chinese Ceramics September 20-25: Connoisseurship of the timeless beauty and outstanding craftsmanship of famous masterpieces. Highlights exquisite export wares, enameled porcelains, recent discoveries, dating controversies, detection of fakes and the market today, as well as tours of renowned collections.

American Antique Furniture September 20-25: Connoisseurship of masterpieces, 1650-1840. Includes great collections, detection of fakes, care of antiques and tours of the Winterthur Museum and the elegant Diplomatic Reception Rooms at the Department of State.

Aircraft Restoration: How To October 4-8: The master craftsmen of the National Air and Space Museum share their many techniques in workshops at the Paul E. Garber Facility (formerly Silver Hill).

Genealogical Research October 4-9: Taught by Milton Rubincam, Marilyn Duncan and other leading authorities, participants learn how to conduct research in major genealogical repositories such as the National Archives, Library of Congress and DAR Library.

Tibet: Lost Horizons October 18-23: The culture, history and art of this rich civilization along with behind-the-scenes tours of the Freer Gallery and the best private Tibetan art collection in the United States.

Historic House Preservation November 1-6: Cosponsored with the Historic House Association of America, nationally known experts advise on all aspects of restoration and tour successful projects from lovely town houses to country estates.

World War II Aviation November 15-20: NASM's outstanding aeronautical staff and guest experts offer new insights into how the major air forces developed, and how quantum jumps in performance were achieved. Includes tours of many of the only surviving planes in the world.

Post-Impressionist Masters March 7-12, 1982: Bill Kloss explores the outstanding paintings of artists such as Gauguin, van Gogh and Cézanne in lavishly illustrated lectures and tours of great museums.

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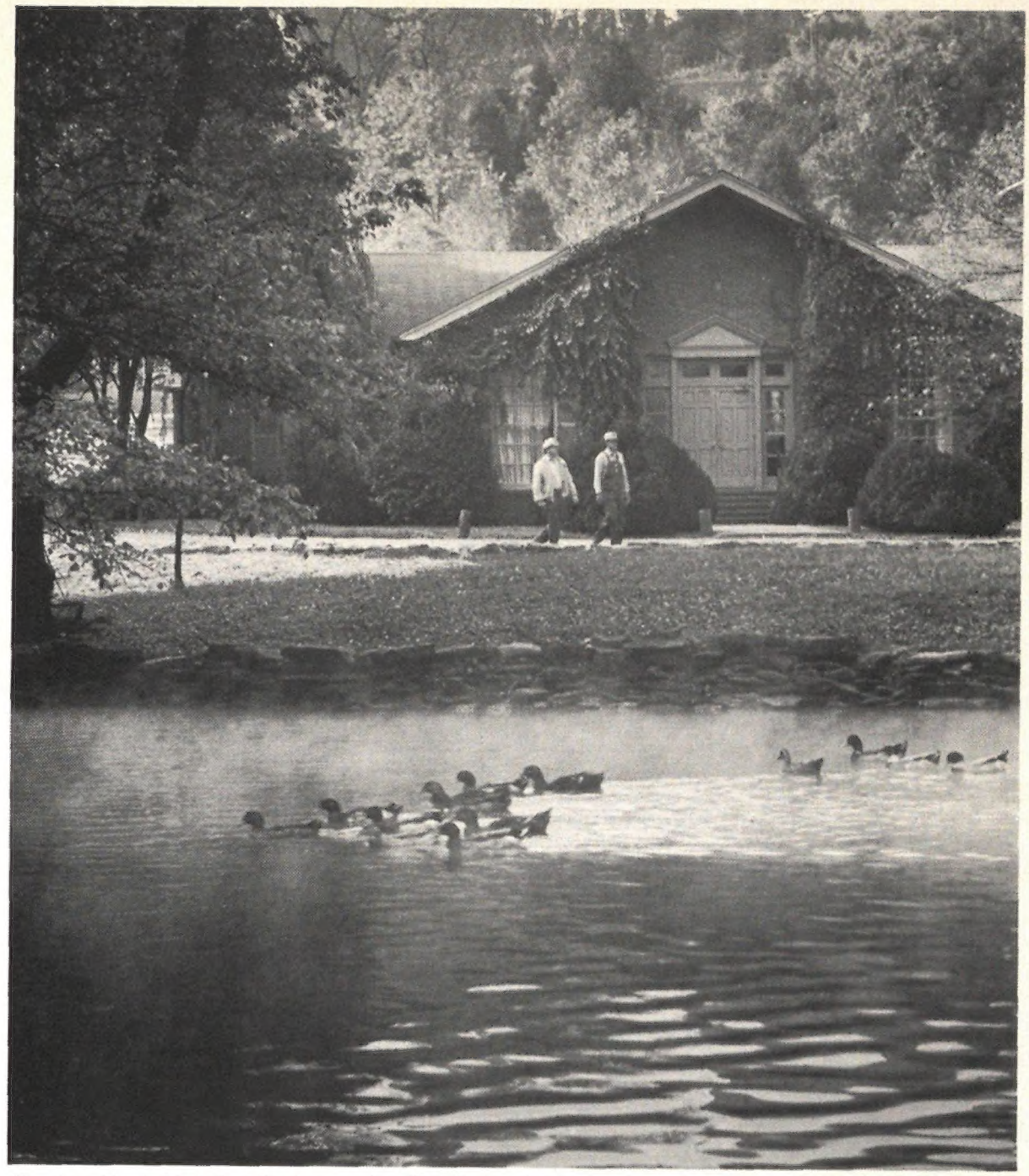

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By Richard Wolkomir

They still cross swords over those crosswords

Where, today, are you apt to find a zax, an adz, an oud? Where do the Icteridae sing? Where does the zebu graze?

The answer, of course, is in crossword puzzles. Every day millions of us, nerved up by the rumpus on page one, turn for fast relief to the newspaper's soothing puzzle page. Considering their instant popularity, a yen for crosswords may be inborn in the race, encoded on our DNA.

New York *World* editor Arthur Wynne invented the crossword on December 21, 1913, as a brightener for the paper's "Fun" section. Readers were so enthusiastic that he made the "Word-Cross" a regular Sunday feature. When Wynne dropped the puzzle from one edition to satisfy carping compositors, he was blown away by an epistolary gale, typified by this gust: "The only thing I give a hang about on your page or in your Sunday magazine is the cross-word puzzle!"

In 1924, urged by the Aunt Wixie of one of the partners, newly hatched Simon and Schuster offered as its first book an anthology of crosswords. Assured by publishing wizards that the tome would instantly drop dead, the company hid behind an alias, "Plaza Publishing." But, in one day, the book was a best seller and America was gaga over crosswords.

In *Crossword Puzzles—Their History and Their Cult*, Roger Millington notes that Baltimore & Ohio Railroad trains carried dictionaries. The Pennsylvania Railroad printed crosswords on the backs of dining-car menus. Couples announced their engagements via crosswords. Women wore crossword-motif frocks. A Chicago wife hauled her husband into court for making her a crossword widow.

"An Enslaved America," scolded a 1924 headline in *The Times* of London. "All America has succumbed to the crossword puzzle." But two months later the paper darkly announced that "the craze had crossed the Atlantic with the speed of a meteorological depression."

Five decades later, puzzlers are still at it. You can, for instance, buy a vinyl shower curtain featuring a jumbo reproduction of the *New York Times* crossword. And, not long ago, a distraught wife begged columnist Ann Landers for advice on her husband, Ed, "a crossword puzzle nut." Out for dinner with other couples, Ed focused on his beloved puzzles, looking up to ask "if anyone knows a five-letter word for an African nit?"

Britons, too, are still puzzling away. But there is a transatlantic difference: British puzzles are brazenly sneaky.

Roger Millington cites a puzzle clue in *The Times* of London that simply said: "The bunippedd." The solution: "Nipped in the bud." Or how about "Dress for the quarterdeck?" To solve it, the puzzler had to recognize that a deck refers to cards, as well as ships. And a quarter of a deck is a "suit."

And then there was the puzzle in another British paper, *The Observer*, that dished up this clue: "An important city in Czechoslovakia." The answer was "Oslo"—Norway's capital neatly spelled out in the middle of the country's name.

Why do otherwise sane folks put up with such nonsense? Why, for example, did Robert Stilgenbauer, of Los Angeles, work from 1938 until 1949 constructing a crossword with 3,185 clues down and 3,149 across? No one has ever worked out that monster, but it did land in the *Guinness Book of World Records.*

Exactly why we crossworders keep at it is mystifying. For years, when I brought home the Sunday *New York Times*, I immediately shredded the crossword page before it could eat up my afternoon. Now I sullenly let it eat away.

Probably there is something intellectually macho about attempting the Sunday *Times* puzzle in ink. And, pressed, you can claim that crosswords enrich your vocabulary—after all, thanks to the puzzles, everyone from corporate panjandrums to Brooklyn cabbies now knows that the Egyptian sun god was "Ra."

But, most of all, Crossword Country's allure is the chance to sneak away, briefly, from the screamer headlines. In this exotic realm we wander among the oryx, the ai, the pangolin, the parr, the dik-dik, the snook. We bow to the ruling emir (sometimes amir, ameer, emeer), the bey, the dey. We mingle with the native tribes, Otoes and Utes. We let our hair blow in the simoon (hot desert wind). Mostly, in Crossword Country, we eat orts.

And that reminds me: what is a six-letter word meaning "extinct South African relative of the zebra?"

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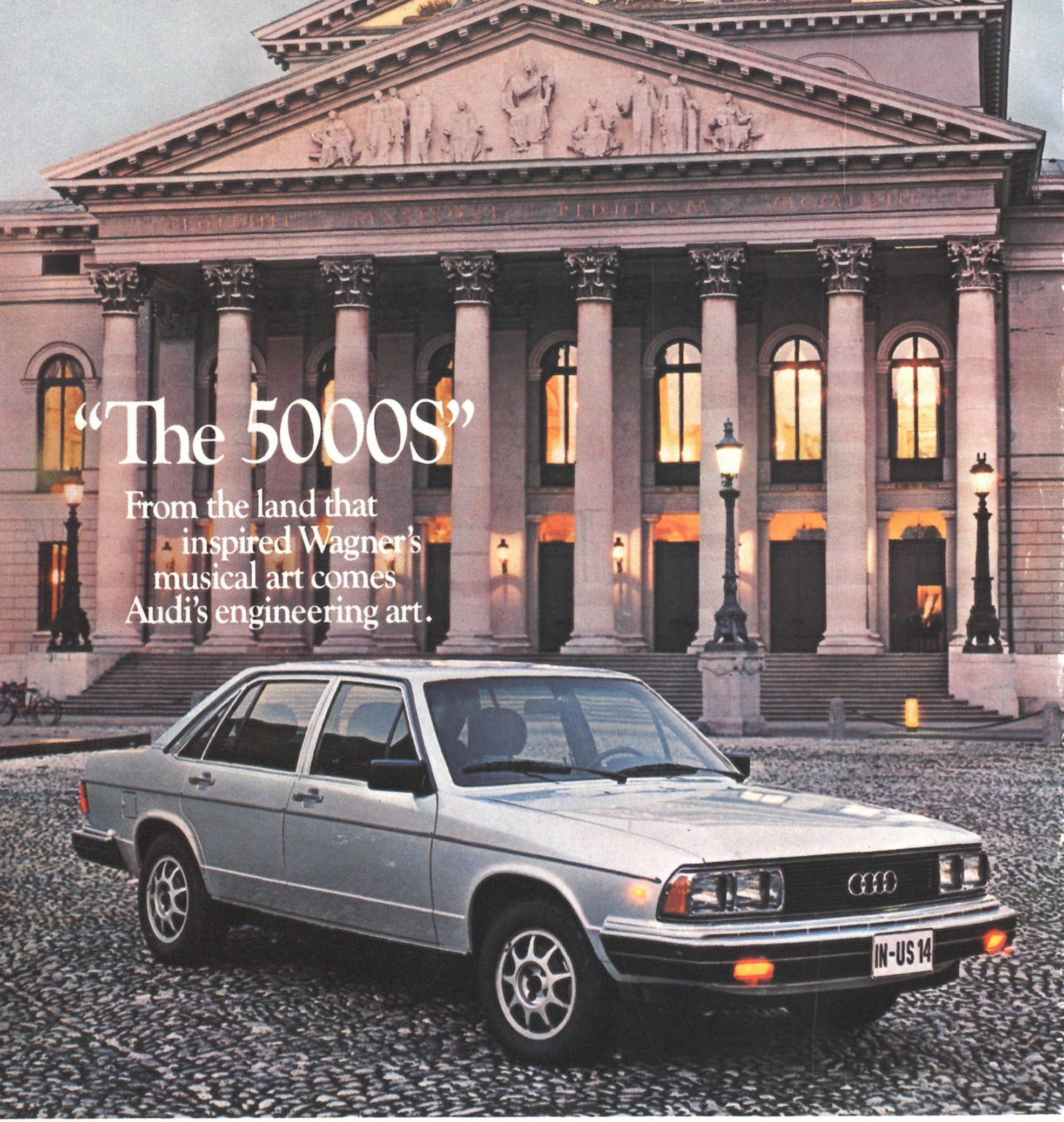

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